



Justin Button-Hutchens
Project Manager

November 1, 2017

Mr. Andrew Maguire
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
Superfund Division, SE-5J
77 W. Jackson Boulevard
Chicago, IL 60604

**Subject: Final Letter Report
U.S. Steel Hexavalent Chromium Spill ER
Portage, Porter County, Indiana
EPA Contract No. EP-S5-13-01
EPA Technical Direction Document (TDD) No. S05-0001-1704-201
Document Tracking No.: 1686**

Dear Mr. Maguire:

Tetra Tech, Inc. (Tetra Tech) is submitting this Final Letter Report summarizing the emergency response activities conducted at the U.S. Steel Hexavalent Chromium Spill ER site from April 11 through April 18, 2017. The final report addresses your comments on the draft report that Tetra Tech submitted on June 6, 2017.

If you have any questions regarding this report, please contact me at (312) 201-7771 or justin.button-hutchens@tetrattech.com.

Respectfully,

A handwritten signature in black ink, appearing to read 'Justin Button-Hutchens'.

Justin Button-Hutchens
Project Manager

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
TDD File

**FINAL LETTER REPORT FOR THE
U.S. STEEL HEXAVALENT CHROMIUM SPILL ER SITE
PORTAGE, PORTER COUNTY, INDIANA 46368**

U.S. Environmental Protection Agency
Emergency Response Branch
Region 5
77 W. Jackson Boulevard
Chicago, IL 60604

Submitted by

Tetra Tech, Inc.
1 South Wacker, 37th Floor
Chicago, Illinois
60606

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Prepared by



Justin Button-Hutchens
Project Manager

Approved by



John Dirgo
START QC Reviewer

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1.0 SUMMARY OF EVENTS

1.1 SITE CONDITIONS AND BACKGROUND

This section provides details on the initial situation and cause of the U.S. Steel Hexavalent Chromium Spill. Under Superfund Technical Assessment and Response Team (START) Contract No. EP-S5-13-01, Technical Direction Document (TDD) No. S05-0001-1704-201, the U.S. Environmental Protection Agency (EPA) tasked Tetra Tech, Inc. (Tetra Tech) START, to perform emergency response (ER) activities at U.S. Steel in Portage, Porter County, Indiana (Appendix A, Figure 1). START was tasked to perform the following:

- Develop a site-specific health and safety plan for on-site activities.
- Perform general oversight that includes written and photographic documentation of site activities.
- Conduct split sample collection with the responsible party (RP) during response activities.
- Track costs related to emergency response activities
- Develop a letter report of activities completed.

This letter report summarizes the activities conducted by Tetra Tech during the ER. Appendix A contains figures illustrating the site location, site layout, surface water sample locations, and sediment sample locations. Appendix B contains the sample summary and results tables. Appendix C provides the START field logbook notes. Appendix D contains the photographic log of response activities. Appendix E provides information on environmentally preferred practices used during this response. Appendix F contains the Pollution/Situation Reports (PolREPs) prepared by EPA during the ER.

1.1.1 Site Location

The site is located on U.S. Steel's Portage Plant at 6300 Highway 12, Portage, Indiana (Appendix A, Figures 1 and 2). The release occurred at Outfall 004 and discharged into the Burns Waterway, a tributary to Lake Michigan. North of Outfall 004, the Burns Waterway feeds into a small harbor which then opens up to Lake Michigan. Approximately 1 mile south of Outfall 004 is a marina used for recreational boating. West of Outfall 004 is Ogden Dunes, a community that resides within the Indiana Dunes National Lakeshore. According to the 2013 census, Ogden Dunes has a population of 1,100.

(b)(9) Geological and Geophysical information and data, including maps, about wells

1.1.2 Initial Situation

At approximately 9:00 central standard time (CST) on April 11, 2017, U.S. Steel employees were doing their rotations for checking on the outfalls for the facility. Rotations are performed every 2 hours on the hour. During their check, employees noticed that the water discharging from Outfall 004 had a vibrant green color.

At 9:33 CST, U.S. Steel notified the National Response Center (NRC) Spill Hotline of the release and NRC Incident Report #1175399 was created. NRC notified EPA and the U.S. Coast Guard (USCG). U.S. Steel also notified the Indiana Department of Environmental Management (IDEM), National Park Services (NPS), and the Porter County Sheriff; and all production processes were shut down.

1.1.3 Cause of Release or Discharge

An assessment of the wastewater treatment plants revealed that process waste water from the Tin and Tin Free electroplating lines at the U.S. Steel Mill had been released. The wastewater was from the process used to treat the steel strip after electroplating, and the rinse water from this process is conveyed via pipe to a dedicated treatment plant. The preliminary investigation by U.S. Steel staff revealed that an expansion joint in the rinse water pipe failed and resulted in the water being released to a different wastewater treatment plant and ultimately into the Burns Waterway through Outfall 004. The Burns Waterway discharges into Lake Michigan, less than 0.25 mile from Outfall 004.

1.1.4 Efforts to Obtain Response by Responsible Party

U.S. Steel was identified as the responsible party for the release of the hexavalent chromium caused by wastewater treatment plant failure.

1.2 ORGANIZATION OF THE RESPONSE, INCLUDING STATE/LOCAL PARTICIPATION

During the emergency response, Incident Command System (ICS) was utilized to organize response activities. Unified Command was established and included EPA, NPS, and U.S. Steel. The Unified Command structure was dissolved on April 18, 2017, and the site was transitioned to IDEM, NPS, and U.S. Steel.

ORGANIZATION OF RESPONSE		
Agencies or Parties Involved	Contact	Description of Participation
U.S. EPA Region 5	Andrew Maguire	Held key roles in ICS structure, including serving as the EPA representative within unified command and planning section. Coordinated emergency response actions.
U.S. Steel	Joseph Hanning Brandon Miller Various	Responsible party, participated as U.S. Steel representatives within unified command in response activities; responsible for coordinating contractors' emergency response activities.
National Park Services	Various	Participated within unified command and performed oversight of START beach sampling during emergency response activities.
Tetra Tech, Inc.	Justin Button-Hutchens Various	START contractor, performed oversight of emergency response activities, multimedia sampling, mapping, data management, and plan review.
ALS Global	Various	U.S. Steel contractor responsible for multimedia sampling.

1.3 ASSESSMENT ACTIVITIES

Assessment activities were conducted by U.S. Steel, the responsible party, in concurrence with EPA. Government trustees, including EPA and NPS, participated in assessment activities through plan review and approval, oversight, split sampling, and providing recommendations. These activities were generally geared toward determining the extent of potential contamination on the site and in surrounding areas, developing plans for the prevention of public exposure, and reviewing U.S. Steel treatment production start-up plans. Section 1.4 includes discussion of the specific activities that were overseen by government trustees.

1.4 CHRONOLOGICAL NARRATIVE OF RESPONSE ACTIONS

At approximately 9:00 CST on April 11, 2017, U.S. Steel employees were performing their 2-hour rotation for checking the outfalls of the facility. During their check, employees noticed that the water discharging from Outfall 004 had a vibrant green color.

At 9:33 CST, U.S. Steel notified the National Response Center (NRC) Spill Hotline of the release and NRC Incident Report #1175399 was created. EPA on-scene coordinators (OSCs) Beslow and Mendez along with USCG deployed to the release. Upon EPA's arrival, U.S. Steel reported the release to be process wastewater containing hexavalent chromium. OSC Maguire was dispatched to the site shortly

thereafter. USCG demobilized after determining the spill was within EPA's jurisdiction. U.S. Steel also notified IDEM, NPS, Indiana American Water, and the Porter County Sherriff. After the spill was discovered, U.S. Steel stopped operations at the plant. An assessment of the wastewater treatment plants revealed that hexavalent chromium had migrated to a treatment plant that was not equipped to treat it. U.S. Steel later reported that approximately 350 pounds of hexavalent chromium had been released.

START personnel mobilized and arrived on-site at approximately 14:20 CST. START noted initial site observations upon arriving at the site. Outfall 004, where the release occurred, was still discharging water that had a vibrant green color. The outfall discharged directly into Burns Waterway, which serves as a local waterway from Lake Michigan to nearby marinas and eventually merges with the Little Calumet River to the south. The flow of the Burns Waterway is semi-dependent on the tides of Lake Michigan. The waterway generally flows south to north, except when strong southerly tides from Lake Michigan force the current south. START's field notes, photographic documentation, and EPA's PolREPs detailing response activities can be found in Appendices C, D, and F respectively.

The hexavalent chromium released from Outfall 004 is completely soluble in water. Once hexavalent chromium reached the outfall, recovery was not feasible because additional chemicals would have to be added to the water. The toxicity of these additional chemicals prohibited their use in the Burns Waterway. U.S. Steel stopped the active release of chromium from the wastewater treatment plant, but residual hexavalent chromium continued to be present at the discharge and additional steps to mitigate the impact were taken. These steps included the isolation and repair of the damaged pipe, and the addition of a water treatment compound, sodium trithiocarbonate (CN_2S_3), to the water stored in the wastewater treatment plant to convert hexavalent chromium to less toxic trivalent chromium. U.S. Steel was given permission from IDEM to use this chemical in its treatment plant to help alleviate the immediate threat.

Initial sampling of both the Burns Waterway and Lake Michigan was performed on April 11, 2017. These samples were analyzed at U.S. Steel's on-site laboratory, and then sent for confirmation of results at U.S. Steel's contracted laboratory, ALS Global (ALS). The on-site U.S. Steel laboratory was used for initial screening, and was able to generate results only for total chromium. Total chromium concentrations were assumed to be equivalent to hexavalent chromium concentrations, and results ranged from 2,231 micrograms per liter ($\mu\text{g/L}$) at Outfall 004 to 15 $\mu\text{g/L}$ near the mouth of the Burns Waterway.

The National Oceanic and Atmospheric Administration (NOAA) and U.S. Fish and Wildlife Service (USFWS) provided ecological risk concentrations for hexavalent as low as 2 $\mu\text{g/L}$ and as high as 20 $\mu\text{g/L}$, while the Agency for Toxic Substances and Disease Registry (ATSDR) provided a human health

concentration of 6 µg/L. As a precaution, local water utility, Indiana American Water in Ogden Dunes, shut down its intake for the Ogden Dunes community. NPS issued a “No Swimming” advisory and closed the nearby lakefront and beaches.

On April 12, 2017, U.S. Steel, EPA, and other agencies reconvened on site at 08:00. U.S. Steel and START collected 58 water samples from Lake Michigan and Burns Waterway, both upstream and downstream of Outfall 004, for laboratory analysis of hexavalent chromium and total chromium (Appendix A, Figures 3a, 3b, and 3c). Samples were collected from the surface, and from the midpoint between the water surface and the bottom depth of the waterway. U.S. Steel and START also collected 14 sediment samples from seven local beaches for laboratory analysis of hexavalent chromium and total chromium (Appendix A, Figure 4). Sediment samples were collected at the tide break point on the shoreline and at wading depth. A summary of collected samples can be found in Table 1 in Appendix B. U.S. Steel continued monitoring its release from Outfall 004.

On April 13, 2017, U.S. Steel, EPA, and other agencies reconvened on site at 08:00 to continue water and sediment sampling. U.S. Steel and START collected 69 water samples from Lake Michigan and Burns Ditch, both upstream and downstream of Outfall 004, for laboratory analysis of hexavalent chromium and total chromium. U.S. Steel and START also collected 16 sediment samples from the various local beaches within proximity to U.S. Steel for laboratory analysis of hexavalent chromium and total chromium. A summary table of collected samples can be found in Table 1 in Appendix B. EPA also held a press briefing outside of the U.S. Steel property with several local and regional news outlets in attendance.

On April 14, 2017, U.S. Steel, EPA, and other agencies reconvened on site at 08:00 to continue sampling. U.S. Steel and START collected 87 water samples from Lake Michigan and Burns Waterway. Samples were collected upstream and downstream of Outfall 004, at various locations on Lake Michigan, and along the shoreline of the local beaches. Water samples were submitted for laboratory analysis of hexavalent chromium and total chromium. U.S. Steel and START also collected 16 sediment samples from the various local beaches within proximity to U.S. Steel for laboratory analysis of hexavalent chromium and total chromium. A summary table of collected samples can be found in Table 1 in Appendix B. U.S. Steel began a heavily monitored re-start process of its plating operations, and reintroduced hexavalent chromium to the process line in defined steps, starting on April 14 and continuing through April 17, 2017. U.S. Steel and EPA monitored this process closely by having visual observing the discharge from Outfall 004. U.S. Steel collected samples at various process points within the wastewater treatment plant. U.S. Steel sent the samples to ALS, and analyzed the samples for

hexavalent chromium and total chromium (results are not included in this report). START also monitored the discharge from Outfall 004 with a water quality meter. START also monitored the Burns Waterway upstream of the release to obtain background readings. Section 2.1 includes additional information on the parameters that were monitored.

On April 15, 2017, U.S. Steel, EPA, and other agencies reconvened on site at 08:00 to continue sampling. U.S. Steel and START collected 86 water samples from Lake Michigan and Burns Waterway. Samples were collected upstream and downstream of Outfall 004, at various locations on Lake Michigan, and along the shoreline of the local beaches. Water samples were submitted for laboratory analysis of hexavalent chromium and total chromium. U.S. Steel and START also collected 16 sediment samples from the various local beaches within proximity to U.S. Steel for laboratory analysis of hexavalent chromium and total chromium. U.S. Steel and START continued monitoring Outfall 004 with a water quality meter.

On April 16, 2017, U.S. Steel, EPA, and other agencies reconvened at 07:00 to continue sampling. U.S. Steel and START collected 84 water samples from Lake Michigan and Burns Waterway. Samples were collected upstream and downstream of Outfall 004, at various locations on Lake Michigan, and along the shoreline of the local beaches. Water samples were submitted for laboratory analysis of hexavalent chromium and total chromium. U.S. Steel and START also collected 16 sediment samples from the various local beaches within proximity to U.S. Steel for laboratory analysis of hexavalent chromium and total chromium. START monitored water quality parameters at Outfall 004 both from shore and by small vessel water craft in the Burns Waterway. U.S. Steel continued to phase in its processes, restarting sections of the plant.

On April 17, 2017, U.S. Steel, EPA, and other agencies reconvened at 09:00 to continue sampling. U.S. Steel and START collected 83 water samples from Lake Michigan and Burns Waterway. Samples were collected upstream and downstream of Outfall 004, at various locations on Lake Michigan, and along the shoreline of the local beaches. Water samples were submitted for laboratory analysis of hexavalent chromium and total chromium. U.S. Steel and START also collected 16 sediment samples from the various local beaches within proximity to U.S. Steel for laboratory analysis of hexavalent chromium and total chromium. START also monitored water quality parameters at Outfall 004 both from shore and by small vessel water craft. At approximately 10:20, U.S. Steel's "Tin Line" process was restarted and was the first process using chromium to go back online. At approximately 12:00, U.S. Steel's "Chrome Line" process was restarted.

On April 18, 2017, U.S. Steel, EPA, and other agencies reconvened at 09:00 to continue sampling. U.S. Steel and START collected 83 water samples from Lake Michigan and Burns Waterway. Samples were collected upstream and downstream of Outfall 004, at various locations on Lake Michigan, and along the shoreline of the local beaches. Water samples were submitted for laboratory analysis of hexavalent chromium and total chromium. U.S. Steel and EPA also collected 12 sediment samples from the various local beaches within proximity to U.S. Steel for laboratory analysis of hexavalent chromium and total chromium. START monitored water quality parameters at Outfall 004 both from shore and by small vessel water craft. All beaches that were previously closed had opened. Indiana American Water's drinking water intake was opened and processing Lake Michigan water.

Release Characterization

The extent of the release of hexavalent chromium to the environment was determined primarily through sampling and, initially, visual inspection. Sampling efforts focused on determining the extent of contamination in the area immediately surrounding the spill site and the extent of contamination that reached the surface waters of Burns Waterway and Lake Michigan, as well as the nearby beaches.

Daily surface water and sediment sampling was conducted by U.S. Steel contractor ALS Global (ALS) and START to determine the extent of contamination in Burns Waterway, Lake Michigan, and the nearby beaches. Surface water and sediment sampling commenced on April 12, 2017. Twenty four surface water sampling locations in Burns Waterway were selected, with samples collected both at the surface and at depth for each location. Six locations were upstream of the spill site (Appendix A, Figure 3a), and 18 locations were adjacent to or downstream of the release within the Burns Waterway (Appendix A, Figure 3b). Twelve offshore surface water sampling locations in Lake Michigan were selected, with samples collected both at the surface and at depth for each location (Appendix A, Figure 3c). In addition, shallow surface water samples were collected at seven beach locations, four east of the spill and three west of the spill (Appendix A, Figure 3d). Sediment samples were also collected at these seven beach locations (Appendix A, Figure 4). From April 12 to April 18, 2017, samples were collected by ALS and START daily from each sample location. Samples were analyzed for hexavalent chromium and total chromium. During the start-up of the chrome process lines, water quality parameters were measured at the outfall, including water temperature, pH, oxidation-reduction potential (ORP), conductivity, and dissolved oxygen (DO).

1.5 SAMPLE SHIPMENT

After collection, the samples were packaged, and delivered by START to STAT Analysis in Chicago, Illinois, from April 12 through April 13. From April 14 through April 18, samples were packaged, picked up by courier, and delivered to Pace Analytical. Surface water samples for hexavalent chromium analysis were delivered to Pace's laboratory in Grand Rapids, Michigan, and all other samples were delivered to Pace's laboratory in Indianapolis, Indiana. Samples were packaged and shipped in accordance with Tetra Tech standard operating procedure (SOP) No. 019-7 "Packaging and Shipping Samples" (Tetra Tech 2014). Chain-of-custody forms accompanied samples from the site to the laboratory.

1.6 SAMPLE ANALYSIS

From April 12 through April 13, water samples were analyzed by STAT Analysis for hexavalent chromium using EPA Method 7196A and for total chromium using EPA Method 6020. Sediment samples were analyzed by STAT Analysis for hexavalent chromium using EPA Method 7196A. Due to the large number of samples collected each day, START then procured PACE Analytical to analyze samples collected from April 14 through April 18. Pace used EPA Method 7196A to analyze hexavalent chromium in water and sediment samples; EPA Method 200.7 to analyze total chromium in water samples; and EPA Method 6010B to analyze total chromium in sediment samples.

2.0 MONITORING AND SAMPLING RESULTS

2.1 WATER MONITORING

START conducted water monitoring at Outfall 004 from April 14 to April 18, 2017 (Appendix A, Figure 2). Parameters that were monitored included pH, DO, temperature, specific conductivity, and ORP. Of these parameters, ORP was prioritized because hexavalent chromium will cause ORP to rise. No significant changes in parameters were observed at Outfall 004 during response monitoring activities. All water monitoring activity and data was logged in START logbooks, and can be found in Appendix C.

2.2 WATER SAMPLING

START collected 551 water samples, including 42 duplicates, with ALS from April 12 through 18 during the response. Samples were collected from the surface, and from the midpoint between the water surface and the bottom depth of the waterway. Surface samples were collected directly from the water surface using 250 mL poly bottles. Samples that were collected at depth used a low flow peristaltic pump and were collected in 250 mL poly bottles. The following sections summarize surface water sample results based on the locations where samples were collected – at Outfall 004; from Burns Waterway upstream of the outfall; from Burns Waterway downstream of the outfall; from offshore areas within Lake Michigan; and from beaches east and west of the spill area.

Data summary tables with individual sample results are provided in Appendix B. Site figures showing sampling locations can be found in Appendix A. The data validation reports for surface water samples can be found in Attachment 1.

Outfall 004

The initial sample collected at Outfall 004 on April 11, 2017, during the response had a hexavalent chromium concentration of 990 micrograms per liter (µg/L). Concentrations in Burns Waterway near the outfall decreased significantly by April 12. Low level detections of hexavalent chromium were found in the surface samples collected on April 12 and April 14. Low level detections of hexavalent chromium were found in deep samples collected on April 12, April 14, and April 15. All detections were below ATSDR screening level of 6 µg/L. From April 16 through April 18, both surface and deep sample results for hexavalent chromium were non-detect. A total of 42 samples were collected adjacent to Outfall 004, with 8 detections for hexavalent chromium occurring between April 12 and April 15. Detections of total chromium for surface and deep samples were below the Maximum Contaminant Level (MCL) of 100 µg/L. A summary of the range of results for the samples collected at Outfall 004 on the Burns Waterway from April 12 through April 18 is found in the table below. Results of individual samples are included in Appendix B (Table 2), and sample locations (C001 through C003) are shown on Figure 3b in Appendix A.

BURNS WATERWAY – OUTFALL 004				
SURFACE SAMPLES			DEEP SAMPLES	
	Hexavalent Chromium	Total Chromium	Hexavalent Chromium	Total Chromium
11-Apr	990	NA	NA	NA
12-Apr	ND to 2.6 J-	1.7 J to 26	ND to 2.6 J-	1.7 J to 28
13-Apr	ND	1.4 J to 1.8 J	ND	1.4 J to 2.0
14-Apr	ND to 2.6 J-	1.4 J to 4.3 J	ND to 0.4 J-	1.8 J to 5.7 J
15-Apr	ND	1.9 J	ND to 0.5 J	1.4 J to 2.4 J
16-Apr	ND	ND	ND	ND
17-Apr	ND	1.4 J to 2.2 J	ND	1.5 J to 2.2 J
18-Apr	ND	1.7 J to 3.7 J	ND	1.9 J to 3.3 J

Notes: All results are in µg/L.

ND = Not detected

NA = Not analyzed

J = The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J- = The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.

Burns Waterway – Upstream of Outfall 004

Samples were collected in Burns Waterway upstream of Outfall 004 to provide an estimate of background concentrations of hexavalent and total chromium in surface water. Low level detections of hexavalent chromium were found in the surface water samples collected on April 12, April 13, April 15, and April 17, and in deep samples collected on April 12. Concentrations were similar to those observed at Outfall 004 from April 12 through April 15. A total of 84 samples were collected upstream of Outfall 004, with 11 detections of hexavalent chromium occurring between April 12 and April 17. All detections were below ATSDR screening level of 6 µg/L. Detections of total chromium for surface and deep samples were below the MCL of 100 µg/L. A summary of the range of results for the samples collected upstream of Outfall 004 on the Burns Waterway from April 12 through April 18 is found in the table below. Results of individual samples are included in Appendix B (Table 2), and sample locations (A001 through B003) can be found on Figure 3a in Appendix A.

	BURNS WATERWAY – UPSTREAM OF OUTFALL 004			
	SURFACE SAMPLES		DEEP SAMPLES	
	Hexavalent Chromium	Total Chromium	Hexavalent Chromium	Total Chromium
12-Apr	ND to 4.5 J-	1.8 J to 2.1	ND to 3.1 J-	1.7 J to 2.0
13-Apr	ND to 2.2 J-	1.4 J to 1.8 J	ND	1.3 J to 1.6 J
14-Apr	ND	1.2 J to 1.9 J	ND	1.1 J to 1.8 J
15-Apr	ND to 0.5 J	1.5 J to 2.3 J	ND	1.4 J to 6.4 J
16-Apr	ND	ND to 2.0 J	ND	ND
17-Apr	ND to 0.4 J	0.91 J to 2.1 J	ND	1.2 J to 2.2 J
18-Apr	ND	1.8 J to 2.2 J	ND	1.8 J to 2.8 J

Notes: All results are in µg/L.

ND = Not detected

J = The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J- = The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.

Burns Waterway – Downstream of Outfall 004

Samples were collected downstream of Outfall 004 to determine the possible extent of contamination within Burns Waterway before it discharges to Lake Michigan. Low level detections of hexavalent chromium were found in the surface and deep water samples on April 12 and April 13, and concentrations were below ATSDR screening levels. On April 14, hexavalent chromium concentrations for one surface sample (15.5 µg/L) and one deep sample (21.5 µg/L) exceeded the ATSDR screening level. These were the only two samples collected after the initial release that had hexavalent chromium concentrations higher than 6 µg/L. A total of 210 samples were collected downstream of Outfall 004 on the Burns Waterway, with 16 detections for hexavalent chromium occurring between April 12 and April 14. No detections of hexavalent chromium occurred from April 15 through April 18. Detections of total chromium for surface and deep samples were below the MCL of 100 µg/L. A summary of the range of results for the samples collected upstream of Outfall 004 on the Burns Waterway from April 12 through April 18 is found in the table below. Results of individual samples are included in Appendix B (Table 2), and sample locations (D001 through H003) can be found on Figure 3b in Appendix A.

	BURNS WATERWAY – DOWNSTREAM OF OUTFALL 004			
	SURFACE SAMPLES		DEEP SAMPLES	
	Hexavalent Chromium	Total Chromium	Hexavalent Chromium	Total Chromium
12-Apr	ND to 2.4 J-	2 to 9.7	ND to 3.6 J-	1.5 to 15
13-Apr	ND to 3.0 J-	1.3 J to 6.9	ND to 2.2 J-	1.6 J to 14
14-Apr	0.4 J- to 15.5 J-	0.6 J to 2.7 J	ND to 21.5 J-	0.78 J to 2.3 J
15-Apr	ND	1.6 J to 8.6 J	ND	1.5 J to 10.3
16-Apr	ND	ND to 4.2 J	ND	ND to 3.7 J
17-Apr	ND	ND to 1.7 J	ND	ND to 1.2 J
18-Apr	ND	1.3 J to 3.4 J	ND	1.9 J to 3.7 J

Notes: All results are in µg/L.

ND = Not detected

J = The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J- = The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.

Lake Michigan

Samples were collected in Lake Michigan to evaluate the extent of possible contamination. A total of 138 samples were collected in Lake Michigan, with 13 detections of hexavalent chromium occurring between April 12 and April 18 in surface and deep water samples. All detections were below ATSDR screening level of 6 µg/L, and concentrations were similar to those found in background samples collected in Burns Waterway upstream of the release. Detections of total chromium for surface and deep water samples were below the MCL of 100 µg/L. A summary of the results for the samples collected in Lake Michigan from April 12 through April 18 is found in the table below. Results of individual samples are included in Appendix B (Table 2), and sample locations (SW-002 through SW-012) can be found on Figure 3c in Appendix A.

LAKE MICHIGAN				
SURFACE SAMPLES			DEEP SAMPLES	
	Hexavalent Chromium	Total Chromium	Hexavalent Chromium	Total Chromium
12-Apr	ND to 2.6 J	2.1 J to 4.9	ND to 2.9 J	1.4 J to 5.5
13-Apr	ND to 2.2 J	1.5 J to 2.0 J	ND	1.6 J to 1.9 J
14-Apr	ND to 0.6 J-	ND to 1.6 J	ND	ND to 2.0 J
15-Apr	ND	ND to 2.2 J	ND to 0.3 J	0.67 J to 1.9 J
16-Apr	ND	ND to 1.6 J	ND	0.78 J to 10 J
17-Apr	ND	ND to 0.84 J	ND	ND to 1.0 J
18-Apr	ND to 0.9 J	0.85 J to 2.6 J	ND to 0.6 J	0.86 J to 2.3 J

Notes: All results are in µg/L.

ND = Not detected

J = The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J- = The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.

Local Beaches

Surface water samples were collected at nearby beaches were taken to evaluate the extent of possible hexavalent chromium contamination and ensure no contamination reached public areas. A total of 40 samples were collected at the surface at the local beaches, with 1 detection for hexavalent chromium occurring on April 14. The detection was below ATSDR screening level of 6 µg/L. Beach samples were not analyzed for total chromium. A summary of the results for the samples collected from nearby local beaches from April 12 through April 18 is found in the table below. Results of individual samples are included in Appendix B (Table 2), and sample locations are shown on Figure 3d in Appendix A.

	LOCAL BEACHES	
	Hexavalent Chromium	Total Chromium
12-Apr	NA	NA
13-Apr	ND	NA
14-Apr	ND to 5.9 J-	NA
15-Apr	ND	NA
16-Apr	ND	NA
17-Apr	ND	NA
18-Apr	ND	NA

Note: All results are in µg/L.

ND = Not detected

NA = Not analyzed

J- = The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.

2.3 SEDIMENT SAMPLING

START and ALS collected 114 sediment samples, including 13 duplicates, during the response from April 12 through 18. The samples were collected at seven nearby beaches. At each beach, one sample was collected on the beach and a second sample was collected within the wake zone. Sample locations are shown on Figure 4 in Appendix A. These samples were collected using disposable scoops to transfer sediment into 4 ounce jars. Sediment sample results are included in Table 3 in Appendix B. The data validation reports can be found in Attachment 1.

Results for hexavalent chromium were compared to the EPA Removal Management Level (RML), which is 30 milligrams per kilogram (mg/kg) (EPA 2016). Hexavalent chromium was detected in only one sample collected from Dunbar Beach on April 16. The concentration (7.3 mg/kg) was below the RML. EPA does not have an RML for total chromium, so results were compared to the EPA Region 5 Ecological Screening Value for total chromium, which is 43.4 mg/kg (EPA 2003). Total chromium had low level detections from April 14 through April 18, but all concentrations were below the EPA Ecological Screening Value. A summary of the results for the samples collected from nearby local beaches from April 12 through April 18 is found in the table below.

	Beach Samples	
	Hexavalent Chromium	Total Chromium
12-Apr	ND	NA
13-Apr	ND	NA
14-Apr	ND	1.5 to 6.7
15-Apr	ND	1.4 to 5.9
16-Apr	ND to 7.3 J-	1.4 to 6.6
17-Apr	ND	1.3 to 8.7
18-Apr	ND	1.3 to 9.2 J

Note: All results are in mg/kg.

ND = Not detected

NA = Not analyzed

J- = The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.

3.0 EFFECTIVENESS OF RESPONSE ACTIVITIES

U.S. Steel was identified as a potentially responsible party for the release of hexavalent chromium resulting from failed process line. Concentrations of hexavalent chromium decreased rapidly from the initial level of 990 µg/L measured on April 11 after the spill occurred. Hexavalent chromium results for surface water samples collected from April 12 through 18 were mostly non-detect or below the ATSDR screening value of 6 µg/L. Only two samples exceeded the screening level – both collected from Burns Waterway on April 14, downstream of the release point. Surface water total chromium results were below the MCL of 100 µg/L. Hexavalent chromium was detected in only one sediment sample at a concentration below the EPA RML of 30 mg/kg. All other samples were non-detect for hexavalent chromium. All sediment sample results for total chromium were below the EPA Region 5 Ecological Screening Level.

Using this data, EPA determined the threat to be mitigated on April 18. U.S. Steel implemented a long-term monitoring plan from April 19 to September 4, 2017, which required collection of surface water samples once per week. Samples were collected at the local beaches, and were collocated with the weekly bacteria sampling performed by National Park Services (NPS). Samples were analyzed for hexavalent chromium and total chromium, and U.S. Steel submitted weekly reports of sample results to U.S. EPA, Indiana American Water, NPS, and IDEM. Hexavalent chromium was not detected in any of the samples collected during the monitoring program. The long-term monitoring period has ended, and U.S. Steel will continue to monitor its discharge from Outfall 004 and submit monthly discharge reports to IDEM.

4.0 REFERENCES

Tetra Tech. 2014. Packaging and Shipping Samples, SOP No. 019-7. November.

U.S. Environmental Protection Agency (EPA). 2003. Ecological Screening Levels. EPA Region 5. August 22.

EPA. 2016. Regional Removal Management Levels for Chemicals (RMLs).
<https://www.epa.gov/risk/regional-removal-management-levels-chemicals-rmls>. May.

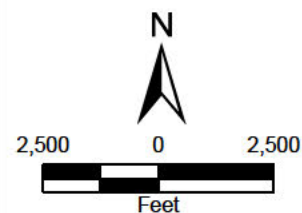
APPENDIX A
FIGURES



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Legend



US Steel Hexavalent Chromium ER
Portage, IN

Figure 1
Site Location
6300 Highway 12, Portage, Indiana



Prepared For: USEPA

Prepared By: Tetra Tech

Source: USGS 7.5 Minute Topographic Quadrangle Map, Englewood, 2015

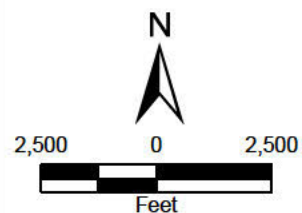
(b)(9) Geological and Geophysical information and data, including maps, about wells



Legend

- Drinking Water Intake
- Outfall 004
- Site Boundary

Source: USGS 7.5 Minute Topographic Quadrangle Map, Englewood, 2015



US Steel Hexavalent Chromium ER
Portage, IN

Figure 2
Site Layout
6300 Highway 12, Portage, Indiana



Prepared For: USEPA

Prepared By: Tetra Tech

File Path: G:\G09028-START\Indiana\US Steel ER\mxd\Figure3a Upstream Surface Water Sample Locations 0.mxd

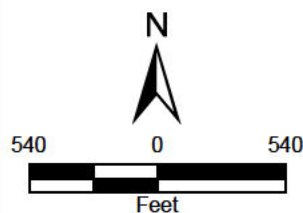


Disclaimer: "Plume" that appears in aerial is from sediment, not from Hexavalent Chromium Spill.

Legend

- Surface Water Samples
- ▭ Site Boundary

Source: USGS 7.5 Minute Topographic Quadrangle Map, Englewood, 2015



US Steel Hexavalent Chromium ER
Portage, IN

Figure 3 Upstream Surface Water Sample Locations



Prepared For: USEPA

Prepared By: Tetra Tech

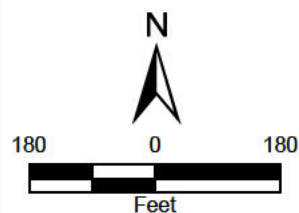


Disclaimer: "Plume" that appears in aerial is from sediment, not from Hexavalent Chromium Spill.

Legend

- Surface Water Samples
- Outfall 004

Source: USGS 7.5 Minute Topographic Quadrangle Map, Englewood, 2015



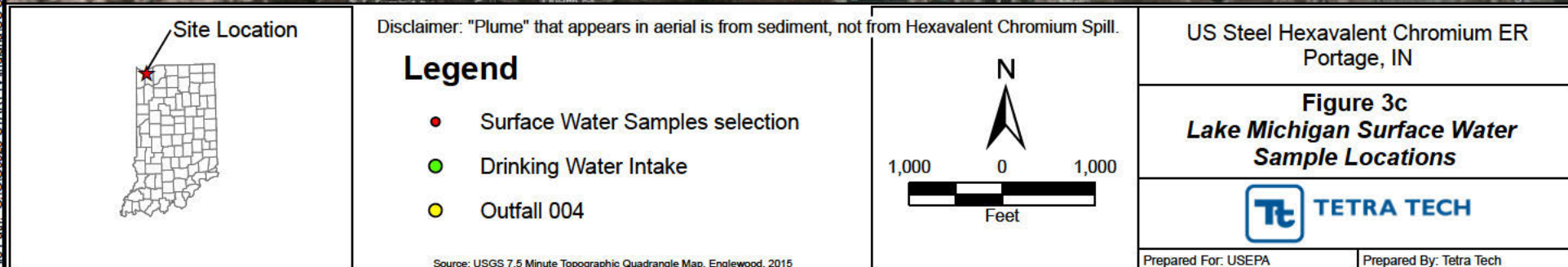
US Steel Hexavalent Chromium ER
Portage, IN

Figure 3b
Downstream Surface Water
Sample Locations

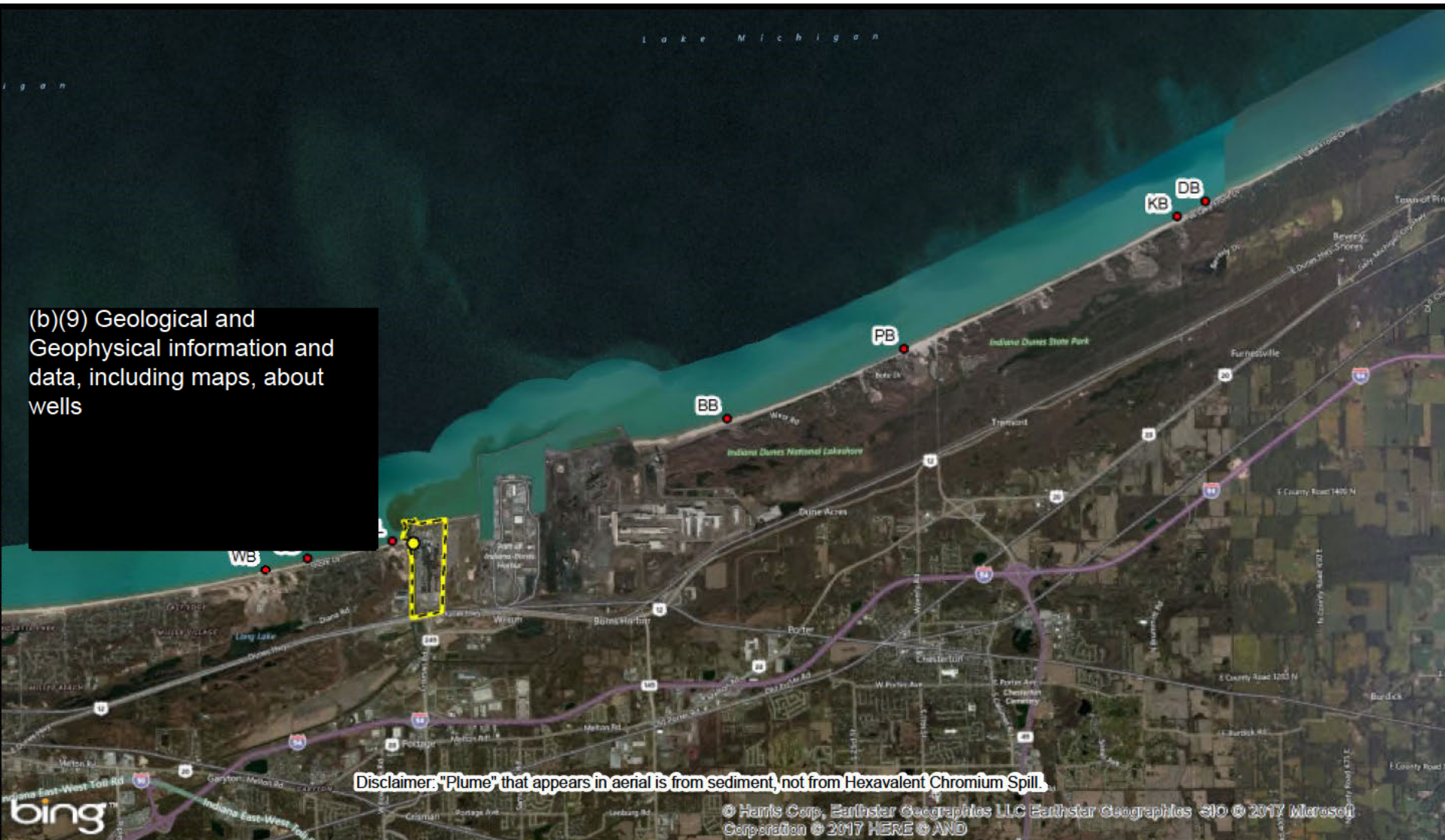


Prepared For: USEPA

Prepared By: Tetra Tech



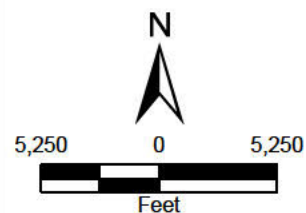
(b)(9) Geological and Geophysical information and data, including maps, about wells



Legend

- Surface Water Samples
- Drinking Water Intake
- Outfall 004
- Site Boundary

Source: USGS 7.5 Minute Topographic Quadrangle Map, Englewood, 2015



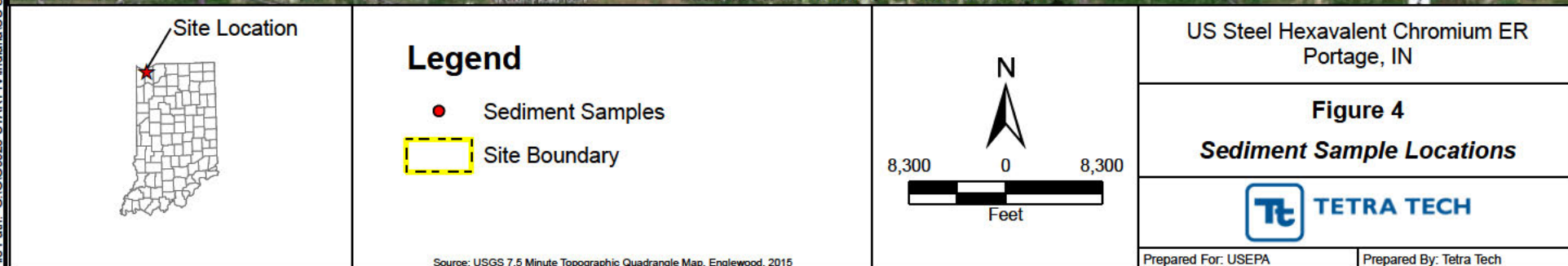
US Steel Hexavalent Chromium ER
Portage, IN

Figure 3d
Local Beach Surface Water
Sample Locations



Prepared For: USEPA

Prepared By: Tetra Tech



APPENDIX B
SUMMARY TABLES

Table 1
U.S. Steel Hexavalent Chromium Spill ER
Sample Summary Table

Sample ID	Matrix	Lab	Date	Sample Collector	Analysis
USS-DW-Wetwell-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SS-BB01-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SS-BB02-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SS-DB01-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SS-DB02-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SS-KB01-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SS-KB02-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SS-OD01-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SS-OD02-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SS-PB01-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SS-PB02-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SS-PL01-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SS-PL02-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SS-WB01-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SS-WB02-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-002-A-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-002-B-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-003-A-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-003-B-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-004-A-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-004-B-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-A001-A-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-A001-B-041217	Drinking Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-A002-A-041217	Sediment	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-A002-B-041217	Sediment	STAT Analysis	4/12/2017	START	Chromium, Total Chromium

Table 1
U.S. Steel Hexavalent Chromium Spill ER
Sample Summary Table

USS-SW-A003-A-041217	Sediment	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-A003-B-041217	Sediment	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-B001-A-041217	Sediment	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-B001-B-041217	Sediment	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-B002-A-041217	Sediment	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-B002-B-041217	Sediment	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-B003-A-041217	Sediment	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-B003-B-041217	Sediment	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-C001-A-041217	Sediment	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-C001-B-041217	Sediment	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-C002-A-041217	Sediment	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-C002-B-041217	Sediment	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-C003-A-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-C003-B-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-D001-A-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-D001-B-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-D002-A-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-D002-B-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-D003-A-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-D003-B-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-E001-A-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-E001-B-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-E002-A-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-E002-B-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-E003-A-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium

Table 1
U.S. Steel Hexavalent Chromium Spill ER
Sample Summary Table

USS-SW-E003-B-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-F001-A-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-F001-B-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-F002-A-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-F002-B-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-F003-A-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-F003-B-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-G001-A-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-G001-B-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-G002-A-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-G002-B-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-G003-A-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-G003-B-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-H001-A-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-H001-B-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-H002-A-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-H002-B-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-H003-A-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-H003-B-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-INTAKE-A-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-INTAKE-A-041217-D	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SW-INTAKE-B-041217	Surface Water	STAT Analysis	4/12/2017	START	Chromium, Total Chromium
USS-SS-BB01-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SS-BB01-041317-D	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SS-BB02-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium

Table 1
U.S. Steel Hexavalent Chromium Spill ER
Sample Summary Table

USS-SS-BB02-041317-D	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SS-DB01-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SS-DB02-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SS-KB01-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SS-KB02-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SS-OD01-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SS-OD02-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SS-PB01-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SS-PB02-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SS-PL01-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SS-PL02-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SS-WB01-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SS-WB02-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-002A-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-002A-041317-D	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-002B-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-002B-041317-D	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-003A-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-003B-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-003B-041317-D	Sediment	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-004A-041317	Sediment	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-004B-041317	Sediment	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-004B-041317-D	Sediment	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-005A-041317	Sediment	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-005B-041317	Sediment	STAT Analysis	4/13/2017	START	Chromium, Total Chromium

Table 1
U.S. Steel Hexavalent Chromium Spill ER
Sample Summary Table

USS-SW-005B-041317-D	Sediment	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-A001-A-041317	Sediment	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-A001-B-041317	Sediment	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-A002-A-041317	Sediment	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-A002-B-041317	Sediment	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-A003-A-041317	Sediment	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-A003-A-041317-D	Sediment	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-A003-B-041317	Sediment	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-B001-A-041317	Sediment	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-B001-B-041317	Sediment	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-B002-A-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-B002-B-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-B003-A-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-B003-B-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-BB02-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-BB02-041317-D	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-C001-A-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-C001-A-041317-D	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-C001-B-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-C002-A-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-C002-B-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-C003-A-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-C003-B-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-D001-A-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-D001-B-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium

Table 1
U.S. Steel Hexavalent Chromium Spill ER
Sample Summary Table

USS-SW-D002-A-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-D002-B-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-D003-A-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-D003-B-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-DB02-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-E001-A-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-E001-B-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-E002-A-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-E002-B-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-E003-A-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-E003-B-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-F001-A-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-F001-B-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-F001-B-041317-D	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-F002-A-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-F002-B-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-F003-A-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-F003-A-041317-D	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-F003-B-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-G001-A-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-G001-B-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-G001-B-041317-D	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-G002-A-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-G002-B-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-G003-A-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium

Table 1
U.S. Steel Hexavalent Chromium Spill ER
Sample Summary Table

USS-SW-G003-B-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-H001-A-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-H001-B-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-H002-A-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-H002-B-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-H003-A-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-H003-B-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-INTAKE-A-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-INTAKE-A-041317-D	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-INTAKE-B-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-KB02-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-OD02-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-PB02-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-PL02-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SW-WB02-041317	Surface Water	STAT Analysis	4/13/2017	START	Chromium, Total Chromium
USS-SS-BB01-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SS-BB02-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SS-DB01-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SS-DB02-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SS-KB01-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SS-KB02-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SS-OD01-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SS-OD02-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SS-PB01-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SS-PB02-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium

Table 1
U.S. Steel Hexavalent Chromium Spill ER
Sample Summary Table

USS-SS-PL01-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SS-PL01-041417-D	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SS-PL02-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SS-PL02-041417-D	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SS-WB01-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SS-WB02-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-002A-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-002B-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-003A-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-003B-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-004A-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-004B-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-004B-041417-D	Sediment	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-005A-041417	Sediment	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-005B-041417	Sediment	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-006A-041417	Sediment	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-006B-041417	Sediment	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-007-A-041417	Sediment	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-007-B-041417	Sediment	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-008-A-041417	Sediment	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-008-B-041417	Sediment	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-009-A-041417	Sediment	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-009-B-041417	Sediment	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-010-A-041417	Sediment	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-010-A-041417-D	Sediment	Pace Analytical	4/14/2017	START	Chromium, Total Chromium

Table 1
U.S. Steel Hexavalent Chromium Spill ER
Sample Summary Table

USS-SW-010-B-041417	Sediment	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-011-A-041417	Sediment	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-011-B-041417	Sediment	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-012-A-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-012-B-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-A001-A-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-A001-A-041417-D	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-A001-B-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-A002-A-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-A002-B-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-A003-A-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-A003-B-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-B001-A-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-B001-B-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-B002-A-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-B002-B-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-B003-A-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-B003-B-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-BB02-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-C001-A-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-C001-B-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-C002-A-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-C002-B-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-C002-B-041417-D	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-C003-A-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium

Table 1
U.S. Steel Hexavalent Chromium Spill ER
Sample Summary Table

USS-SW-C003-B-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-D001-A-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-D001-B-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-D002-A-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-D002-B-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-D003-A-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-D003-B-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-DB02-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-E001-A-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-E001-A-041417-D	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-E001-B-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-E002-A-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-E002-B-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-E003-A-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-E003-B-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-F001-A-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-F001-B-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-F001-B-041417-D	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-F002-A-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-F002-B-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-F003-A-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-F003-B-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-G001-A-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-G001-B-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-G002-A-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium

Table 1
U.S. Steel Hexavalent Chromium Spill ER
Sample Summary Table

USS-SW-G002-B-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-G003-A-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-G003-B-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-H001-A-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-H001-B-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-H002-A-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-H002-A-041417-D	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-H002-B-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-H003-A-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-H003-B-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-Intake-A-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-Intake-B-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-KB02-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-OD02-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-PB02-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-PL02-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-WB02-041417	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SW-WB02-041417-D	Surface Water	Pace Analytical	4/14/2017	START	Chromium, Total Chromium
USS-SS-BB01-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SS-BB02-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SS-DB01-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SS-DB02-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SS-KB01-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SS-KB02-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SS-OD01-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium

Table 1
U.S. Steel Hexavalent Chromium Spill ER
Sample Summary Table

USS-SS-OD01-041517-D	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SS-OD02-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SS-PB01-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SS-PB02-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SS-PB02-041517-D	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SS-PL01-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SS-PL02-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SS-WB01-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SS-WB02-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-002-A-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-002-B-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-003-A-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-003-B-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-004-A-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-004A-041517-D	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-004-B-041517	Sediment	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-005-A-041517	Sediment	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-005-B-041517	Sediment	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-006-A-041517	Sediment	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-006-B-041517	Sediment	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-007-A-041517	Sediment	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-007-B-041517	Sediment	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-008-A-041517	Sediment	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-008-B-041517	Sediment	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-008B-041517-D	Sediment	Pace Analytical	4/15/2017	START	Chromium, Total Chromium

Table 1
U.S. Steel Hexavalent Chromium Spill ER
Sample Summary Table

USS-SW-009-A-041517	Sediment	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-009-B-041517	Sediment	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-010-A-041517	Sediment	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-010-B-041517	Sediment	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-011-A-041517	Sediment	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-011-B-041517	Sediment	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-012-A-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-012A-041517-D	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-012-B-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-A001-A-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-A001-B-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-A002-A-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-A002-B-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-A003-A-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-A003-B-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-B001-A-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-B001-B-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-B002-A-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-B002-A-041517-D	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-B002-B-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-B003-A-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-B003-B-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-BB02-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-C001-A-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-C001-B-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium

Table 1
U.S. Steel Hexavalent Chromium Spill ER
Sample Summary Table

USS-SW-C001-B-041517-D	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-C002-A-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-C002-B-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-C003-A-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-C003-B-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-D001-A-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-D001-B-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-D002-A-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-D002-A-041517-D	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-D002-B-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-D003-A-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-D003-B-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-DB02-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-DB02-041517-D	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-E001-A-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-E001-B-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-E002-A-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-E002-A-041517-D	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-E002-B-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-E003-A-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-E003-B-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-F001-A-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-F001-B-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-F002-A-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-F002-B-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium

Table 1
U.S. Steel Hexavalent Chromium Spill ER
Sample Summary Table

USS-SW-F003-A-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-F003-B-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-G001-A-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-G001-B-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-G002-A-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-G002-B-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-G003-A-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-G003-B-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-H001-A-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-H001-B-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-H002-A-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-H002-B-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-H003-A-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-H003-B-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-Intake-A-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-Intake-B-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-KB02-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-OD02-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-PB02-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-PL02-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SW-WB02-041517	Surface Water	Pace Analytical	4/15/2017	START	Chromium, Total Chromium
USS-SS-BB01-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SS-BB01-041617-D	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SS-BB02-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SS-DB01-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium

Table 1
U.S. Steel Hexavalent Chromium Spill ER
Sample Summary Table

USS-SS-DB02-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SS-KB01-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SS-KB02-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SS-OD01-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SS-OD02-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SS-PB01-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SS-PB02-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SS-PL01-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SS-PL02-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SS-WB01-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SS-WB02-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SS-WB02-041617-D	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-002-A-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-002-A-041617-D	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-002-B-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-003-A-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-003-B-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-004-A-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-004-B-041617	Sediment	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-005-A-041617	Sediment	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-005-B-041617	Sediment	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-005B-041617-D	Sediment	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-006-A-041617	Sediment	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-006-B-041617	Sediment	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-007-A-041617	Sediment	Pace Analytical	4/16/2017	START	Chromium, Total Chromium

Table 1
U.S. Steel Hexavalent Chromium Spill ER
Sample Summary Table

USS-SW-007-B-041617	Sediment	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-008-A-041617	Sediment	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-008-B-041617	Sediment	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-009-A-041617	Sediment	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-009-B-041617	Sediment	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-010-A-041617	Sediment	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-010-B-041617	Sediment	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-011-A-041617	Sediment	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-011-B-041617	Sediment	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-012-A-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-012-B-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-A001-A-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-A001-B-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-A002-A-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-A002-B-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-A003-A-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-A003-B-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-B001-A-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-B001-B-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-B002-A-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-B002-B-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-B002-B-041617-D	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-B003-A-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-B003-B-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-BB02-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium

Table 1
U.S. Steel Hexavalent Chromium Spill ER
Sample Summary Table

USS-SW-C001-A-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-C001-B-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-C002-A-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-C002-B-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-C003-A-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-C003-B-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-D001-A-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-D001-B-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-D002-A-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-D002-A-041617-D	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-D002-B-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-D003-A-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-D003-B-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-DB02-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-E001-A-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-E001-B-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-E002-A-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-E002-B-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-E003-A-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-E003-B-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-F001-A-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-F001-B-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-F002-A-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-F002-B-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-F003-A-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium

Table 1
U.S. Steel Hexavalent Chromium Spill ER
Sample Summary Table

USS-SW-F003-B-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-G001-A-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-G001-B-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-G002-A-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-G002-B-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-G003-A-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-G003-B-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-H001-A-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-H001-B-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-H002-A-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-H002-B-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-H003-A-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-H003-B-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-Intake-A-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-Intake-B-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-KB02-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-OD02-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-PB02-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-PB02-041617-D	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-PL02-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SW-WB02-041617	Surface Water	Pace Analytical	4/16/2017	START	Chromium, Total Chromium
USS-SS-BB01-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SS-BB02-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SS-DB01-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SS-DB01-041717-D	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium

Table 1
U.S. Steel Hexavalent Chromium Spill ER
Sample Summary Table

USS-SS-DB02-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SS-KB01-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SS-KB02-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SS-OD01-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SS-OD02-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SS-PB01-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SS-PB02-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SS-PB02-041717-D	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SS-PL01-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SS-PL02-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SS-WB01-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SS-WB02-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-002A-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-002B-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-003A-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-003A-041717-D	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-003B-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-004A-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-004B-041717	Sediment	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-005A-041717	Sediment	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-005B-041717	Sediment	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-006A-041717	Sediment	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-006B-041717	Sediment	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-007-A-041717	Sediment	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-007-B-041717	Sediment	Pace Analytical	4/17/2017	START	Chromium, Total Chromium

Table 1
U.S. Steel Hexavalent Chromium Spill ER
Sample Summary Table

USS-SW-008-A-041717	Sediment	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-008-B-041717	Sediment	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-009-A-041717	Sediment	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-009-B-041717	Sediment	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-010-A-041717	Sediment	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-010-B-041717	Sediment	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-011-A-041717	Sediment	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-011-B-041717	Sediment	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-012-A-041717	Sediment	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-012-B-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-A001-A-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-A001-B-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-A002-A-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-A002-B-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-A003-A-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-A003-B-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-B001-A-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-B001-B-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-B002-A-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-B002-B-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-B003-A-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-B003-B-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-BB02-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-C001-A-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-C001-B-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium

Table 1
U.S. Steel Hexavalent Chromium Spill ER
Sample Summary Table

USS-SW-C002-A-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-C002-B-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-C003-A-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-C003-B-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-D001-A-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-D001-B-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-D002-A-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-D002-B-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-D003-A-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-D003-B-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-DB02-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-E001-A-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-E001-B-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-E002-A-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-E002-B-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-E003-A-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-E003-B-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-F001-A-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-F001-B-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-F002-A-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-F002-B-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-F003-A-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-F003-B-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-G001-A-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-G001-B-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium

Table 1
U.S. Steel Hexavalent Chromium Spill ER
Sample Summary Table

USS-SW-G002-A-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-G002-B-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-G003-A-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-G003-B-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-H001-A-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-H001-B-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-H002-A-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-H002-A-041717-D	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-H002-B-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-H003-A-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-H003-B-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-Intake-A-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-Intake-A-041717-D	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-Intake-B-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-KB02-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-OD02-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-PB02-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-PL02-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-WB02-041717	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SW-WB02-041717-D	Surface Water	Pace Analytical	4/17/2017	START	Chromium, Total Chromium
USS-SS-BB01-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SS-BB02-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SS-OD01-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SS-OD02-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SS-PB01-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium

Table 1
U.S. Steel Hexavalent Chromium Spill ER
Sample Summary Table

USS-SS-PB02-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SS-PB02-041817-D	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SS-PL01-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SS-PL02-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SS-WB01-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SS-WB01-041817-D	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SS-WB02-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-002A-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-002B-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-003A-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-003-A-041817-D	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-003B-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-004A-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-004B-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-005A-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-005B-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-006A-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-006B-041817	Sediment	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-007-A-041817	Sediment	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-007-B-041817	Sediment	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-008-A-041817	Sediment	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-008-B-041817	Sediment	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-009-A-041817	Sediment	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-009-B-041817	Sediment	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-010-A-041817	Sediment	Pace Analytical	4/18/2017	START	Chromium, Total Chromium

Table 1
U.S. Steel Hexavalent Chromium Spill ER
Sample Summary Table

USS-SW-010-B-041817	Sediment	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-011-A-041817	Sediment	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-011-B-041817	Sediment	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-012-A-041817	Sediment	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-012-B-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-A001-A-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-A001-B-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-A002-A-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-A002-B-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-A003-A-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-A003-B-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-B001-A-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-B001-B-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-B002-A-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-B002-A-041817-D	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-B002-B-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-B003-A-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-B003-B-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-BB02-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-C001-A-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-C001-B-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-C002-A-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-C002-A-041817-D	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-C002-B-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-C003-A-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium

Table 1
U.S. Steel Hexavalent Chromium Spill ER
Sample Summary Table

USS-SW-C003-B-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-D001-A-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-D001-B-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-D002-A-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-D002-B-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-D003-A-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-D003-B-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-E001-A-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-E001-B-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-E002-A-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-E002-B-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-E003-A-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-E003-B-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-F001-A-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-F001-B-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-F002-A-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-F002-B-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-F003-A-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-F003-B-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-G001-A-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-G001-B-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-G002-A-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-G002-B-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-G003-A-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-G003-B-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium

Table 1
U.S. Steel Hexavalent Chromium Spill ER
Sample Summary Table

USS-SW-H001-A-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-H001-B-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-H002-A-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-H002-B-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-H003-A-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-H003-B-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-Intake-A-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-Intake-A-041817-D	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-Intake-B-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-OD02-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-PB02-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-PL02-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-PL02-041817-D	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium
USS-SW-WB02-041817	Surface Water	Pace Analytical	4/18/2017	START	Chromium, Total Chromium

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-002-A-041217	USS-SW-002-A-041317	USS-SW-002-A-041317-D	USS-SW-002-A-041417	USS-SW-002-A-041517	USS-SW-002-A-041617	USS-SW-002-A-041617-D	USS-SW-002-A-041717	USS-SW-002-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	2.6 J	2.2 J	NA	1 UJ	1 U	1 U	1 U	1 U	1 U
Chromium	100	-	4.7	1.7 J	1.8 J	1.4 J	1.3 J	1.2 J	NA	10 U	1.5 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may

be biased low.

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered

approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-002-B-041217	USS-SW-002-B-041317	USS-SW-002-B-041317-D	USS-SW-002-B-041417	USS-SW-002-B-041517	USS-SW-002-B-041617	USS-SW-002-B-041717	USS-SW-002-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	2.6 J	10 U	10 U	1 UJ	0.3 J	1 U	1 U	1 U
Chromium	100	-	4.9	1.7 J	1.8 J	1.6 J	1.2 J	1.2 J	0.66 J	0.86 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

- J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
- J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
- U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
- UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-003-A-041217	USS-SW-003-A-041317	USS-SW-003-A-041417	USS-SW-003-A-041517	USS-SW-003-A-041617	USS-SW-003-A-041717	USS-SW-003-A-041717-D	USS-SW-003-A-041817	USS-SW-003-A-041817-D
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	2.5 J	10 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U
Chromium	100	-	4.9	1.5 J	1.2 J	1.8 J	1.5 U	10 U	NA	1.7 J	NA

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may

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U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered

approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-003-B-041217	USS-SW-003-B-041317	USS-SW-003-B-041317-D	USS-SW-003-B-041417	USS-SW-003-B-041517	USS-SW-003-B-041617	USS-SW-003-B-041717	USS-SW-003-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	2.9 J	10 U	NA	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	5.5	1.8 J	1.6 J	1.6 J	0.96 J	10 J	10 U	1.8 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be

biased low.

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered

approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-004-A-041217	USS-SW-004-A-041317	USS-SW-004-A-041417	USS-SW-004-A-041517	USS-SW-004-A-041517-D	USS-SW-004-A-041617	USS-SW-004-A-041717	USS-SW-004-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 U	10 U	1 UJ	1 U	1 U	1 U	1 U	1 U
Chromium	100	-	4.4	1.5 J	1.5 J	2.2 J	NA	0.97 J	10 U	2.6 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-004-B-041217	USS-SW-004-B-041317	USS-SW-004-B-041317-D	USS-SW-004-B-041417	USS-SW-004-B-041417-D	USS-SW-004-B-041517	USS-SW-004-B-041617	USS-SW-004-B-041717	USS-SW-004-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	2.1 J	10 U	10 U	1 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	4.6	1.5 J	1.6 J	10 U	2 J	1.3 J	1.4 J	0.57 J	1.5 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be

biased low.

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered

approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-005-A-041317	USS-SW-005-A-041417	USS-SW-005-A-041517	USS-SW-005-A-041617	USS-SW-005-A-041717	USS-SW-005-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 U	0.4 J-	1 U	1 U	1 U	1 U
Chromium	100	-	1.5 J	0.84 J	1.7 J	0.98 J	0.84 J	2 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

- J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
- J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
- U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
- UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-005-B-041317	USS-SW-005-B-041317-D	USS-SW-005-B-041417	USS-SW-005-B-041517	USS-SW-005-B-041617	USS-SW-005B-041617-D	USS-SW-005-B-041717	USS-SW-005-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 U	NA	1 UJ	1 U	1 U	1 U	1 U	1 U
Chromium	100	-	1.5 J	1.6 J	10 U	0.67 J	1.2	NA	10 U	1.7 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Analyte	MCL	ATSDR Screening Level	USS-SW-006-A-041417	USS-SW-006-A-041517	USS-SW-006-A-041617	USS-SW-006-A-041717	USS-SW-006-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	1.5 J	0.82 J	1.5 J	10 U	0.85 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

- J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
- J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
- U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
- UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Analyte	MCL	ATSDR Screening Level	USS-SW-006-B-041417	USS-SW-006-B-041517	USS-SW-006-B-041617	USS-SW-006-B-041717	USS-SW-006-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	1 UJ	1 U	1 U	1 U	0.6 J
Chromium	100	-	1.2 J	1.9 J	1 J	0.76 J	2.3 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

- J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
- J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
- U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
- UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Analyte	MCL	ATSDR Screening Level	USS-SW-007-A-041417	USS-SW-007-A-041517	USS-SW-007-A-041617	USS-SW-007-A-041717	USS-SW-007-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	1 UJ	1 U	1 U	1 U	0.9 J
Chromium	100	-	1.4 J	1.4 J	1.6 J	0.6 J	0.9 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Analyte	MCL	ATSDR Screening Level	USS-SW-007-B-041417	USS-SW-007-B-041517	USS-SW-007-B-041617	USS-SW-007-B-041717	USS-SW-007-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	1.4 J	1.2 J	1.1 J	1 J	1.2 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

- J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
- J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
- U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
- UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Analyte	MCL	ATSDR Screening Level	USS-SW-008-A-041417	USS-SW-008-A-041517	USS-SW-008-A-041617	USS-SW-008-A-041717	USS-SW-008-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	1.4 J	10 U	1.2 J	0.74 J	1.5 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

- J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
- J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
- U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
- UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-008-B-041417	USS-SW-008-B-041517	USS-SW-008B-041517-D	USS-SW-008-B-041617	USS-SW-008-B-041717	USS-SW-008-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	1 UJ	1 U	1 U	1 U	1 U	1 U
Chromium	100	-	1.2 J	1.9 J	NA	1.9 J	0.92 J	1.8 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

- J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
- J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
- U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
- UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Analyte	MCL	ATSDR Screening Level	USS-SW-009-A-041417	USS-SW-009-A-041517	USS-SW-009-A-041617	USS-SW-009-A-041717	USS-SW-009-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	10 U	1.9 J	0.96 J	10 U	1.4 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may

be biased low.

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered

approximate due to deficiencies in one or more quality control criteria.

Analyte	MCL	ATSDR Screening Level	USS-SW-009-B-041417	USS-SW-009-B-041517	USS-SW-009-B-041617	USS-SW-009-B-041717	USS-SW-009-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	1 UJ	0.3 J	1 U	1 U	1 U
Chromium	100	-	1.3 J	1.1 J	1.8 J	0.87 J	1.3 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

- J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-010-A-041417	USS-SW-010-A-041417-D	USS-SW-010-A-041517	USS-SW-010-A-041617	USS-SW-010-A-041717	USS-SW-010-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	1 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	0.86 J	0.98 J	1.7 J	1.6 J	10 U	1 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

UJ The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Analyte	MCL	ATSDR Screening Level	USS-SW-010-B-041417	USS-SW-010-B-041517	USS-SW-010-B-041617	USS-SW-010-B-041717	USS-SW-010-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	1 UJ	1 U	1 UJ	1 U	1 U
Chromium	100	-	0.94 J	1.2 J	1.7 J	10 U	1.2 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may

be biased low.

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered

approximate due to deficiencies in one or more quality control criteria.

Analyte	MCL	ATSDR Screening Level	USS-SW-011-A-041417	USS-SW-011-A-041517	USS-SW-011-A-041617	USS-SW-011-A-041717	USS-SW-011-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	0.6 J	1 U	1 UJ	1 U	1 U
Chromium	100	-	0.69 J	1.5 J	1.5 J	10 U	2.2 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

UJ The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Analyte	MCL	ATSDR Screening Level	USS-SW-011-B-041417	USS-SW-011-B-041517	USS-SW-011-B-041617	USS-SW-011-B-041717	USS-SW-011-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	1 UJ	1 U	1 U	1 U	0.6 J
Chromium	100	-	1.2 J	1.2 J	1.2 J	0.49 J	1.3 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-012-A-041417	USS-SW-012-A-041517	USS-SW-012A-041517-D	USS-SW-012-A-041617	USS-SW-012-A-041717	USS-SW-012-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	1 UJ	1 U	1 U	1 U	1 U	1 U
Chromium	100	-	0.99 J	1.3 J	NA	1.1 J	10 U	1.7 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Analyte	MCL	ATSDR Screening Level	USS-SW-012-B-041417	USS-SW-012-B-041517	USS-SW-012-B-041617	USS-SW-012-B-041717	USS-SW-012-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	1.5 J	0.97 J	1.1 J	10 U	1.8 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may

be biased low.

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UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered

approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-A001-A-041217	USS-SW-A001-A-041317	USS-SW-A001-A-041417	USS-SW-A001-A-041417-D	USS-SW-A001-A-041517	USS-SW-A001-A-041617	USS-SW-A001-A-041717	USS-SW-A001-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 UJ	2.2 J-	1 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	1.8 J	1.7 J	1.2 J	1.2 J	1.5 J	10 U	2.1 J	2.1 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

- J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
- J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
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Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-A001-B-041217	USS-SW-A001-B-041317	USS-SW-A001-B-041417	USS-SW-A001-B-041517	USS-SW-A001-B-041617	USS-SW-A001-B-041717	USS-SW-A001-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 UJ	10 J-	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	1.8 J	1.6 J	1.4 J	2.4 J	10 U	1.4 J	2.8 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

- J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
- J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
- U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
- UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Analyte	MCL	ATSDR Screening Level	USS-SW-A002-A-041217	USS-SW-A002-A-041317	USS-SW-A002-A-041417	USS-SW-A002-A-041517	USS-SW-A002-A-041617	USS-SW-A002-A-041717	USS-SW-A002-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 UJ	10 UJ	1 UJ	0.5 J	1 U	1 U	1 U
Chromium	100	-	1.9 J	1.5 J	1.4 J	2.2 J	10 U	1.5 J	1.8 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

- J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
- J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
- U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
- UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Analyte	MCL	ATSDR Screening Level	USS-SW-A002-B-041217	USS-SW-A002-B-041317	USS-SW-A002-B-041417	USS-SW-A002-B-041517	USS-SW-A002-B-041617	USS-SW-A002-B-041717	USS-SW-A002-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	2.4 J	10 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	1.9 J	1.5 J	1.1 J	2.2 J	10 U	1.2 J	2.5 J

Notes
NA Not Analyzed
NC No Criteria
mg/kg Milligrams per kilogram
J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
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UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-A003-A-041217	USS-SW-A003-A-041317	USS-SW-A003-A-041317-D	USS-SW-A003-A-041417	USS-SW-A003-A-041517	USS-SW-A003-A-041617	USS-SW-A003-A-041717	USS-SW-A003-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	2.4 J-	10 UJ	2 J-	1 UJ	1 U	1 U	0.4 J	1 U
Chromium	100	-	1.9 J	1.4 J	NA	1.3 J	1.8 J	10 U	1.9 J	2.1 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

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approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-A003-B-041217	USS-SW-A003-B-041317	USS-SW-A003-B-041417	USS-SW-A003-B-041517	USS-SW-A003-B-041617	USS-SW-A003-B-041717	USS-SW-A003-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 UJ	10 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	1.7 J	1.3 J	1.8 J	1.4 J	10 U	2.2 J	1.8 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

UJ The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-B001-A-041217	USS-SW-B001-A-041317	USS-SW-B001-A-041417	USS-SW-B001-A-041517	USS-SW-B001-A-041617	USS-SW-B001-A-041717	USS-SW-B001-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	2.2 J	10 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	1.8 J	1.5 J	1.7 J	2.3 J	10 U	1.8 J	1.8 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may

be biased low.

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approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-B001-B-041217	USS-SW-B001-B-041317	USS-SW-B001-B-041417	USS-SW-B001-B-041517	USS-SW-B001-B-041617	USS-SW-B001-B-041717	USS-SW-B001-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	2.1 J-	10 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	2	1.4 J	1.4 J	2.8 J	10 U	1.7 J	2.1 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

- J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
- J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
- U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
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Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-B002-A-041217	USS-SW-B002-A-041317	USS-SW-B002-A-041417	USS-SW-B002-A-041517	USS-SW-B002-A-041517-D	USS-SW-B002-A-041617	USS-SW-B002-A-041717	USS-SW-B002-A-041817	USS-SW-B002-A-041817-D
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	2.2 J-	10 UJ	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U
Chromium	100	-	2.1	1.6 J	1.5 J	1.5 J	NA	10 U	0.91 J	2 J	NA

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

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approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-B002-B-041217	USS-SW-B002-B-041317	USS-SW-B002-B-041417	USS-SW-B002-B-041517	USS-SW-B002-B-041617	USS-SW-B002-B-041617-D	USS-SW-B002-B-041717	USS-SW-B002-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 UJ	10 UJ	1 UJ	1 U	1 U	1 U	1 U	1 U
Chromium	100	-	1.8 J	1.4 J	1.3 J	2.7 J	10 U	NA	1.7 J	2 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

UJ The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.

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UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-B003-A-041217	USS-SW-B003-A-041317	USS-SW-B003-A-041417	USS-SW-B003-A-041517	USS-SW-B003-A-041617	USS-SW-B003-A-041717	USS-SW-B003-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	4.5 J-	10 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	1.8 J	1.8 J	1.9 J	2.3 J	2 J	2 J	2.2 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may

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UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered

approximate due to deficiencies in one or more quality control criteria.

Analyte	MCL	ATSDR Screening Level	USS-SW-B003-B-041217	USS-SW-B003-B-041317	USS-SW-B003-B-041417	USS-SW-B003-B-041517	USS-SW-B003-B-041617	USS-SW-B003-B-041717	USS-SW-B003-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	3.1 J	10 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	1.9 J	1.4 J	1.4 J	6.4 J	10 U	1.2 J	2.6 J

Notes
NA Not Analyzed
NC No Criteria
mg/kg Milligrams per kilogram
J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
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UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-C001-A-041217	USS-SW-C001-A-041317	USS-SW-C001-A-041317-D	USS-SW-C001-A-041417	USS-SW-C001-A-041517	USS-SW-C001-A-041617	USS-SW-C001-A-041717	USS-SW-C001-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 UJ	10 UJ	NA	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	1.7 J	1.4 J	1.4 J	1.7 J	1.9 J	10 U	1.4 J	1.7 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

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Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-C001-B-041217	USS-SW-C001-B-041317	USS-SW-C001-B-041417	USS-SW-C001-B-041517	USS-SW-C001-B-041517-D	USS-SW-C001-B-041617	USS-SW-C001-B-041717	USS-SW-C001-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 UJ	10 UJ	1 UJ	1 U	1 U	1 U	1 U	1 U
Chromium	100	-	1.7 J	1.4 J	1.9 J	2.4 J	NA	10 U	2.2 J	2 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may

be biased low.

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered

approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-C002-A-041217	USS-SW-C002-A-041317	USS-SW-C002-A-041417	USS-SW-C002-A-041517	USS-SW-C002-A-041617	USS-SW-C002-A-041717	USS-SW-C002-A-041817	USS-SW-C002-A-041817-D
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 UJ	10 UJ	1 UJ	1 U	1 U	1 U	1 U	1 U
Chromium	100	-	1.7 J	1.6 J	1.4 J	1.9 J	10 U	1.4 J	2.3 J	NA

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

UJ The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

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Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-C002-B-041217	USS-SW-C002-B-041317	USS-SW-C002-B-041417	USS-SW-C002-B-041417-D	USS-SW-C002-B-041517	USS-SW-C002-B-041617	USS-SW-C002-B-041717	USS-SW-C002-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	2.6 J-	10 UJ	0.4 J-	1 UJ	0.3 J	1 U	1 U	1 U
Chromium	100	-	9.4	1.5 J	1.3 J	1.8 J	1.4 J	10 U	1.8 J	1.9 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

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approximate due to deficiencies in one or more quality control criteria.

Analyte	MCL	ATSDR Screening Level	USS-SW-C003-A-041217	USS-SW-C003-A-041317	USS-SW-C003-A-041417	USS-SW-C003-A-041517	USS-SW-C003-A-041617	USS-SW-C003-A-041717	USS-SW-C003-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	2.6 J-	10 UJ	2.6 J-	1 U	1 U	1 U	1 U
Chromium	100	-	26	1.8 J	4.3 J	1.9 J	10 U	2.2 J	3.7 J

Notes
NA Not Analyzed
NC No Criteria
mg/kg Milligrams per kilogram
J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
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Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-C003-B-041217	USS-SW-C003-B-041317	USS-SW-C003-B-041417	USS-SW-C003-B-041517	USS-SW-C003-B-041617	USS-SW-C003-B-041717	USS-SW-C003-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	2.1 J	10 UJ	1 UJ	0.5 J	1 U	1 U	1 U
Chromium	100	-	28	2	5.7 J	2.2 J	10 U	1.5 J	3.3 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

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UJ approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-D001-A-041217	USS-SW-D001-A-041317	USS-SW-D001-A-041417	USS-SW-D001-A-041517	USS-SW-D001-A-041617	USS-SW-D001-A-041717	USS-SW-D001-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 UJ	10 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	2.8	1.9 J	1.8 J	2 J	10 U	1.4 J	2.2 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

UJ The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.

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Analyte	MCL	ATSDR Screening Level	USS-SW-D001-B-041217	USS-SW-D001-B-041317	USS-SW-D001-B-041417	USS-SW-D001-B-041517	USS-SW-D001-B-041617	USS-SW-D001-B-041717	USS-SW-D001-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 UJ	10 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	2.5	2.9	2 J	1.6 J	10 U	1.2 J	2.8 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

- J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
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Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-D002-A-041217	USS-SW-D002-A-041317	USS-SW-D002-A-041417	USS-SW-D002-A-041517	USS-SW-D002-A-041517-D	USS-SW-D002-A-041617	USS-SW-D002-A-041617-D	USS-SW-D002-A-041717	USS-SW-D002-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 UJ	10 UJ	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U
Chromium	100	-	2	1.5 J	1.4 J	1.8 J	NA	10 U	NA	1.7 J	2.1 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

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Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-D002-B-041217	USS-SW-D002-B-041317	USS-SW-D002-B-041417	USS-SW-D002-B-041517	USS-SW-D002-B-041617	USS-SW-D002-B-041717	USS-SW-D002-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	2.5 J-	10 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	2.3	1.6 J	0.91 J	2.3 J	2.3 J	10 U	1.9 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

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approximate due to deficiencies in one or more quality control criteria.

Analyte	MCL	ATSDR Screening Level	USS-SW-D003-A-041217	USS-SW-D003-A-041317	USS-SW-D003-A-041417	USS-SW-D003-A-041517	USS-SW-D003-A-041617	USS-SW-D003-A-041717	USS-SW-D003-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	2.2 J-	10 UJ	15.5 J-	1 U	1 U	1 U	1 U
Chromium	100	-	9.2	1.6 J	1.3 J	8.6 J	4.2 J	10 U	2.6 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

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Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-D003-B-041217	USS-SW-D003-B-041317	USS-SW-D003-B-041417	USS-SW-D003-B-041517	USS-SW-D003-B-041617	USS-SW-D003-B-041717	USS-SW-D003-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 UJ	10 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	8.8	1.7 J	1.9 J	10.3	3.7 J	10 U	2.5 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

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Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-E001-A-041217	USS-SW-E001-A-041317	USS-SW-E001-A-041417	USS-SW-E001-A-041417-D	USS-SW-E001-A-041517	USS-SW-E001-A-041617	USS-SW-E001-A-041717	USS-SW-E001-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 UJ	10 UJ	1 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	2.6	2 J	1.6 J	1.6 J	2.5 J	1.1 J	10 U	2.2 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

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Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-E001-B-041217	USS-SW-E001-B-041317	USS-SW-E001-B-041417	USS-SW-E001-B-041517	USS-SW-E001-B-041617	USS-SW-E001-B-041717	USS-SW-E001-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 UJ	10 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	2.5	2.2	0.78 J	2 J	2.8 J	10 U	3.7 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

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Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-E002-A-041217	USS-SW-E002-A-041317	USS-SW-E002-A-041417	USS-SW-E002-A-041517	USS-SW-E002-A-041517-D	USS-SW-E002-A-041617	USS-SW-E002-A-041717	USS-SW-E002-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 UJ	10 UJ	1 UJ	1 U	1 U	1 U	1 U	1 U
Chromium	100	-	2.7	2.9	2 J	1.9 J	NA	2.2 J	0.73 J	2.8 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

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Analyte	MCL	ATSDR Screening Level	USS-SW-E002-B-041217	USS-SW-E002-B-041317	USS-SW-E002-B-041417	USS-SW-E002-B-041517	USS-SW-E002-B-041617	USS-SW-E002-B-041717	USS-SW-E002-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 UJ	10 UJ	21.5 J-	1 U	1 U	1 U	1 U
Chromium	100	-	2.6	2.1	0.9 J	2.3 J	2.1 J	10 U	2.3 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

- J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
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Analyte	MCL	ATSDR Screening Level	USS-SW-E003-A-041217	USS-SW-E003-A-041317	USS-SW-E003-A-041417	USS-SW-E003-A-041517	USS-SW-E003-A-041617	USS-SW-E003-A-041717	USS-SW-E003-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	2.2 J	10 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	5.7	1.7 J	2.7 J	2.4 J	1.9 J	10 U	3.4 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

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Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-E003-B-041217	USS-SW-E003-B-041317	USS-SW-E003-B-041417	USS-SW-E003-B-041517	USS-SW-E003-B-041617	USS-SW-E003-B-041717	USS-SW-E003-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 UJ	10 UJ	1.4 J-	1 U	1 U	1 U	1 U
Chromium	100	-	6.5	1.9 J	1.8 J	1.8 J	2.2 J	10 U	3.2 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

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Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-F001-A-041217	USS-SW-F001-A-041317	USS-SW-F001-A-041417	USS-SW-F001-A-041517	USS-SW-F001-A-041617	USS-SW-F001-A-041717	USS-SW-F001-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 UJ	10 UJ	0.4 J-	1 U	1 U	1 U	1 U
Chromium	100	-	2.6	6.9	1.6 J	1.6 J	2.2 J	10 U	2.4 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

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Analyte	MCL	ATSDR Screening Level	USS-SW-F001-B-041217	USS-SW-F001-B-041317	USS-SW-F001-B-041317-D	USS-SW-F001-B-041417	USS-SW-F001-B-041417-D	USS-SW-F001-B-041517	USS-SW-F001-B-041617	USS-SW-F001-B-041717	USS-SW-F001-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	2.5 J-	10 UJ	NA	1 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	3.4	2.1	2.1	0.68 J	1.4 J	2.5 J	1.6 J	10 U	2.1 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

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Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-F002-A-041217	USS-SW-F002-A-041317	USS-SW-F002-A-041417	USS-SW-F002-A-041517	USS-SW-F002-A-041617	USS-SW-F002-A-041717	USS-SW-F002-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 UJ	10 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	2.4	2.3	1 J	2.2 J	2.9 J	10 U	2.3 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

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Table 2
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Water Sample Results Summary Table

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	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 UJ	10 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	2.5	2.6	1.7 J	1.6 J	1.9 J	10 U	2.8 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

- J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
- J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
- U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
- UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-F003-A-041217	USS-SW-F003-A-041317	USS-SW-F003-A-041317-D	USS-SW-F003-A-041417	USS-SW-F003-A-041517	USS-SW-F003-A-041617	USS-SW-F003-A-041717	USS-SW-F003-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 UJ	10 UJ	NA	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	7.2	2.9	2.3	1.5 J	2.2 J	2.4 J	0.6 J	1.7 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered

approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-F003-B-041217	USS-SW-F003-B	USS-SW-F003-B-041417	USS-SW-F003-B-041517	USS-SW-F003-B-041617	USS-SW-F003-B-041717	USS-SW-F003-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	2.3 J-	10 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	6.9	2.6	1.7 J	NA	2.1 J	10 U	3 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Analyte	MCL	ATSDR Screening Level	USS-SW-G001-A-041217	USS-SW-G001-A-041317	USS-SW-G001-A-041417	USS-SW-G001-A-041517	USS-SW-G001-A-041617	USS-SW-G001-A-041717	USS-SW-G001-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 UJ	10 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	5.8	1.5 J	0.6 J	1.8 J	1.8 J	10 U	2.4 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

- J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
- J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
- U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
- UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-G001-B-041217	USS-SW-G001-B-041317	USS-SW-G001-B-041317-D	USS-SW-G001-B-041417	USS-SW-G001-B-041517	USS-SW-G001-B-041617	USS-SW-G001-B-041717	USS-SW-G001-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	3.6 J-	10 UJ	10 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	5.7	1.6 J	2.6	0.87 J	2 J	2.3 J	10 U	3.5 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered

UJ approximate due to deficiencies in one or more quality control criteria.

Analyte	MCL	ATSDR Screening Level	USS-SW-G002-A-041217	USS-SW-G002-A-041317	USS-SW-G002-A-041417	USS-SW-G002-A-041517	USS-SW-G002-A-041617	USS-SW-G002-A-041717	USS-SW-G002-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	2.4 J-	10 UJ	1.2 J-	1 U	1 U	1 U	1 U
Chromium	100	-	7.1	1.3 J	1.7 J	1.6 J	2.1 J	10 U	2.9 J

Notes
NA Not Analyzed
NC No Criteria
mg/kg Milligrams per kilogram
J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
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UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-G002-B-041217	USS-SW-G002-B-041317	USS-SW-G002-B-041417	USS-SW-G002-B-041517	USS-SW-G002-B-041617	USS-SW-G002-B-041717	USS-SW-G002-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	2.2 J-	2.2 J-	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	6.1	2 J	1.6 J	1.5 J	2.6 J	10 U	2.7 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may

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UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered

approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-G003-A-041217	USS-SW-G003-A-041317	USS-SW-G003-A-041417	USS-SW-G003-A-041517	USS-SW-G003-A-041617	USS-SW-G003-A-041717	USS-SW-G003-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 UJ	10 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	7.1	2.8	1.3 J	2.6 J	2.1 J	10 U	2.5 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may

be biased low.

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approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-G003-B-041217	USS-SW-G003-B-041317	USS-SW-G003-B-041417	USS-SW-G003-B-041517	USS-SW-G003-B-041617	USS-SW-G003-B-041717	USS-SW-G003-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	2.1 J	10 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	7.7	3.2	1.4 J	3.2 J	3.4 J	10 U	2.4 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may

be biased low.

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approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-H001-A-041217	USS-SW-H001-A-041317	USS-SW-H001-A-041417	USS-SW-H001-A-041517	USS-SW-H001-A-041617	USS-SW-H001-A-041717	USS-SW-H001-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 UJ	10 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	6.3	3	2.1 J	1.9 J	2.2 J	10 U	2 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

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UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-H001-B-041217	USS-SW-H001-B-041317	USS-SW-H001-B-041417	USS-SW-H001-B-041517	USS-SW-H001-B-041617	USS-SW-H001-B-041717	USS-SW-H001-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 UJ	10 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	6.7	3.1	1.5 J	1.6 J	1.7 J	0.57 J	2 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

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U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-H002-A-041217	USS-SW-H002-A-041317	USS-SW-H002-A-041417	USS-SW-H002-A-041417-D	USS-SW-H002-A-041517	USS-SW-H002-A-041617	USS-SW-H002-A-041717	USS-SW-H002-A-041717-D	USS-SW-H002-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 UJ	3 J-	1 UJ	1 UJ	1 U	1 U	1 U	1 U	1 U
Chromium	100	-	9.7	3.2	1.7 J	1.4 J	1.7 J	2.3 J	10 U	NA	2.5 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

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Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-H002-B-041217	USS-SW-H002-B-041317	USS-SW-H002-B-041417	USS-SW-H002-B-041517	USS-SW-H002-B-041617	USS-SW-H002-B-041717	USS-SW-H002-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 UJ	10 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	15	14	2.3 J	2.6 J	2.3 J	0.76 J	2 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

UJ The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Analyte	MCL	ATSDR Screening Level	USS-SW-H003-A-041217	USS-SW-H003-A041317	USS-SW-H003-A-041417	USS-SW-H003-A-041517	USS-SW-H003-A-041617	USS-SW-H003-A-041717	USS-SW-H003-A-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 UJ	10 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	8.5	1.8 J	2.7 J	2.4 J	2.5 J	0.52 J	1.3 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

- J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
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Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-H003-B-041217	USS-SW-H003-B-041317	USS-SW-H003-B-041417	USS-SW-H003-B-041517	USS-SW-H003-B-041617	USS-SW-H003-B-041717	USS-SW-H003-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 UJ	10 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	9.1	1.9 J	1.4 J	2.9 J	2.8 J	0.59 J	2 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

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U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Analyte	MCL	ATSDR Screening Level	USS-SW-BB02-041317	USS-SW-BB02-041317-D	USS-SW-BB02-041417	USS-SW-BB02-041517	USS-SW-BB02-041617	USS-SW-BB02-041717	USS-SW-BB02-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	0.01 UJ	0.01 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	NA	NA	NA	NA	NA	NA	NA

Notes
 NA Not Analyzed
 NC No Criteria
 mg/kg Milligrams per kilogram
 J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
 J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
 U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
 UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-PB02-041317	USS-SW-PB02-041417	USS-SW-PB02-041517	USS-SW-PB02-041617	USS-SW-PB02-041617-D	USS-SW-PB02-041717	USS-SW-PB02-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	0.01 UJ	1 UJ	1 U	1 U	1 U	1 U	1 U
Chromium	100	-	NA	NA	NA	NA	NA	NA	NA

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered

UJ approximate due to deficiencies in one or more quality control criteria.

Analyte	MCL	ATSDR Screening Level	USS-SW-KB02-041317	USS-SW-KB02-041417	USS-SW-KB02-041517	USS-SW-KB02-041617	USS-SW-KB02-041717
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	0.01 UJ	1 UJ	1 U	1 U	1 U
Chromium	100	-	NA	NA	NA	NA	NA

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

- J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
- J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
- U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
- UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-DB02-041317	USS-SW-DB02-041417	USS-SW-DB02-041517	USS-SW-DB02-041517-D	USS-SW-DB02-041617	USS-SW-DB02-041717
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	0.01 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	NA	NA	NA	NA	NA	NA

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may

be biased low.

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered

approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-WB02-041317	USS-SW-WB02-041417	USS-SW-WB02-041417-D	USS-SW-WB02-041517	USS-SW-WB02-041617	USS-SW-WB02-041717	USS-SW-WB02-041717-D	USS-SW-WB02-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	0.01 UJ	1 UJ	1 UJ	1 U	1 U	1 U	1 U	1 U
Chromium	100	-	NA	NA	NA	NA	NA	NA	NA	NA

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Analyte	MCL	ATSDR Screening Level	USS-SW-OD02-041317	USS-SW-OD02-041417	USS-SW-OD02-041517	USS-SW-OD02-041617	USS-SW-OD02-041717	USS-SW-OD02-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	0.01 UJ	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	NA	NA	NA	NA	NA	NA

Notes
NA Not Analyzed
NC No Criteria
mg/kg Milligrams per kilogram
J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-PL02-041317	USS-SW-PL02-041417	USS-SW-PL02-041517	USS-SW-PL02-041617	USS-SW-PL02-041717	USS-SW-PL02-041817	USS-SW-PL02-041817-D
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	0.01 UJ	5.9 J-	1 U	1 U	1 U	1 U	1 U
Chromium	100	-	NA	NA	NA	NA	NA	NA	NA

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

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approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-INTAKE-A-041217	USS-SW-INTAKE-A-041217-D	USS-SW-INTAKE-A-041317	USS-SW-INTAKE-A-041317-D	USS-SW-INTAKE-A-041417	USS-SW-INTAKE-A-041517	USS-SW-INTAKE-A-041617	USS-SW-INTAKE-A-041717	USS-SW-INTAKE-A-041717-D	USS-SW-INTAKE-A-041817	USS-SW-INTAKE-A-041817-D
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 UJ	10 UJ	10 U	NA	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U
Chromium	100	-	2.1	2	2 J	1.8 J	10 U	0.9 J	1 J	0.76 J	NA	0.99 J	NA

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may

be biased low.

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered

approximate due to deficiencies in one or more quality control criteria.

Table 2
U.S. Steel Hexavalent Chromium Spill ER
Water Sample Results Summary Table

Analyte	MCL	ATSDR Screening Level	USS-SW-INTAKE-B-041217	USS-SW-INTAKE-B-041317	USS-SW-INTAKE-B-041417	USS-SW-INTAKE-B-041517	USS-SW-INTAKE-B-041617	USS-SW-INTAKE-B-041717	USS-SW-INTAKE-B-041817
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	10 UJ	10 U	1 UJ	1 U	1 U	1 U	1 U
Chromium	100	-	1.4 J	1.9 J	1.1 J	1.3 J	0.78 J	10 U	0.93 J

Notes

- NA Not Analyzed
- NC No Criteria
- mg/kg Milligrams per kilogram
- J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
- J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
- U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
- UJ The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

Analyte	MCL	ATSDR Screening Level	USS-SW-001-041117	USS-DW-Wetwell-041217
	µg/L	µg/L	µg/L	µg/L
Hexavalent Chromium	NC	6	990	10 UJ
Chromium	100	-	-	0.94 J

Notes

NA Not Analyzed
NC No Criteria

mg/kg Milligrams per kilogram

- J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
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Table 3
U.S. Steel Hexavalent Chromium Spill ER
Sediment Sample Results Summary Table

Analyte	EPA RML (Residential Soil)	EPA Ecological	USS-SS-BB01-041217	USS-SS-BB01-041317	USS-SS-BB01-041317-D	USS-SS-BB01-041417	USS-SS-BB01-041517	USS-SS-BB01-041617	USS-SS-BB01-041617-D	USS-SS-BB01-041717	USS-SS-BB01-041817
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Hexavalent Chromium	30		0.4 U	0.4 U	0.4 U	2 U	2 U	2 U	2 U	2 U	1.9 U
Chromium	NC	43.4	NA	NA	NA	2.9	4.1	6.6	3.4	1.3	2.7

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

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Table 3
U.S. Steel Hexavalent Chromium Spill ER
Sediment Sample Results Summary Table

Analyte	EPA RML (Residential Soil)	USS-SS-BB02-041217	USS-SS-BB02-041317	USS-SS-BB02-041317-D	USS-SS-BB02-041417	USS-SS-BB02-041517	USS-SS-BB02-041617	USS-SS-BB02-041717	USS-SS-BB02-041817
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Hexavalent Chromium	30	0.4 U	0.4 U	0.4 U	2 U	2 U	2 U	2 U	2 U
Chromium	NC	NA	NA	NA	4.2	3.6	5.1	5.8	7.3

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

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Table 3
U.S. Steel Hexavalent Chromium Spill ER
Sediment Sample Results Summary Table

Analyte	EPA RML (Residential Soil)	USS-SS-DB01-041217	USS-SS-DB01-041317	USS-SS-DB01-041417	USS-SS-DB01-041517	USS-SS-DB01-041617	USS-SS-DB01-041717	USS-SS-DB01-041717-D
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Hexavalent Chromium	30	0.4 U	0.4 U	2 U	2 U	7.3 J-	1.9 U	2 U
Chromium	NC	NA	NA	4.3	3.4	5.4	4.1	2.6

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

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Table 3
U.S. Steel Hexavalent Chromium Spill ER
Sediment Sample Results Summary Table

Analyte	EPA RML (Residential Soil)	USS-SS-DB02-041217	USS-SS-DB02-041317	USS-SS-DB02-041417	USS-SS-DB02-041517	USS-SS-DB02-041617	USS-SS-DB02-041717
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Hexavalent Chromium	30	0.4 U	0.4 U	2 U	2 U	1.9 U	2 U
Chromium	NC	NA	NA	5.2	3.5	4.3	1.8

Notes
 NA Not Analyzed
 NC No Criteria
 mg/kg Milligrams per kilogram
 J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
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Table 3
U.S. Steel Hexavalent Chromium Spill ER
Sediment Sample Results Summary Table

Analyte	EPA RML (Residential Soil)	USS-SS-KB01-041217	USS-SS-KB01-041317	USS-SS-KB01-041417	USS-SS-KB01-041517	USS-SS-KB01-041617	USS-SS-KB01-041717
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Hexavalent Chromium	30	0.4 U	0.4 U	2 U	2 U	2 U	2 U
Chromium	NC	NA	NA	1.5	2.8	2	1.9

Notes
 NA Not Analyzed
 NC No Criteria
 mg/kg Milligrams per kilogram
 J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
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Table 3
U.S. Steel Hexavalent Chromium Spill ER
Sediment Sample Results Summary Table

Analyte	EPA RML (Residential Soil)	USS-SS-KB02-041217	USS-SS-KB02-041317	USS-SS-KB02-041417	USS-SS-KB02-041517	USS-SS-KB02-041617	USS-SS-KB02-041717
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Hexavalent Chromium	30	0.4 U	0.4 U	2 U	2 U	2 U	2 U
Chromium	NC	NA	NA	4.8	2.9	1.4	2.3

Notes
 NA Not Analyzed
 NC No Criteria
 mg/kg Milligrams per kilogram
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Table 3
U.S. Steel Hexavalent Chromium Spill ER
Sediment Sample Results Summary Table

Analyte	EPA RML (Residential Soil)	USS-SS-OD01-041217	USS-SS-OD01-041317	USS-SS-OD01-041417	USS-SS-OD01-041517	USS-SS-OD01-041517-D	USS-SS-OD01-041617	USS-SS-OD01-041717	USS-SS-OD01-041817
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Hexavalent Chromium	30	0.4 U	0.4 U	2 U	2 U	2 U	2 U	2 U	1.9 U
Chromium	NC	NA	NA	2.1	5.9	3.2	2.2	2.1	1.3

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

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Table 3
U.S. Steel Hexavalent Chromium Spill ER
Sediment Sample Results Summary Table

Analyte	EPA RML (Residential Soil)	USS-SS-OD02-041217	USS-SS-OD02-041317	USS-SS-OD02-041417	USS-SS-OD02-041517	USS-SS-OD02-041617	USS-SS-OD02-041717	USS-SS-OD02-041817
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Hexavalent Chromium	30	0.4 U	0.4 U	2 U	2 U	2 U	1.9 U	1.9 U
Chromium	NC	NA	NA	2.8	1.4	3.4	2	4.3

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

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Table 3
U.S. Steel Hexavalent Chromium Spill ER
Sediment Sample Results Summary Table

Analyte	EPA RML (Residential Soil)	USS-SS-PB01-041217	USS-SS-PB01-041317	USS-SS-PB01-041417	USS-SS-PB01-041517	USS-SS-PB01-041617	USS-SS-PB01-041717	USS-SS-PB01-041817
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Hexavalent Chromium	30	0.4 U	0.4 U	2 U	2 U	2 U	2 U	2 U
Chromium	NC	NA	NA	6.7	2.8	3.9	2.5	1.8

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

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Table 3
U.S. Steel Hexavalent Chromium Spill ER
Sediment Sample Results Summary Table

Analyte	EPA RML (Residential Soil)	USS-SS-PB02-041217	USS-SS-PB02-041317	USS-SS-PB02-041417	USS-SS-PB02-041517	USS-SS-PB02-041517-D	USS-SS-PB02-041617	USS-SS-PB02-041717	USS-SS-PB02-041717-D	USS-SS-PB02-041817	USS-SS-PB02-041817-D
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Hexavalent Chromium	30	0.4 U	0.4 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Chromium	NC	NA	NA	2.2	2.9	3.9	1.9	3.7	2.8	9.2 J	3.6 J

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

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Table 3
U.S. Steel Hexavalent Chromium Spill ER
Sediment Sample Results Summary Table

Analyte	EPA RML (Residential Soil)	USS-SS-PL01-041217	USS-SS-PL01-041317	USS-SS-PL01-041417	USS-SS-PL01-041417-D	USS-SS-PL01-041517	USS-SS-PL01-041617	USS-SS-PL01-041717	USS-SS-PL01-041817
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Hexavalent Chromium	30	0.4 U	0.4 U	2 U	2 U	2 U	2 U	2 U	1.9 U
Chromium	NC	NA	NA	2.2	2.9	4.6	3.5	3.3	2.7

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

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U.S. Steel Hexavalent Chromium Spill ER
Sediment Sample Results Summary Table

Analyte	EPA RML (Residential Soil)	USS-SS-PL02-041217	USS-SS-PL02-041317	USS-SS-PL02-041417	USS-SS-PL02-041417-D	USS-SS-PL02-041517	USS-SS-PL02-041617	USS-SS-PL02-041717	USS-SS-PL02-041817
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Hexavalent Chromium	30	0.4 U	0.4 U	2 U	2 U	2 U	2 U	2 U	2 U
Chromium	NC	NA	NA	3.5 J	10 J	5.6	2.4	8.7	4.8

Notes

NA Not Analyzed

NC No Criteria

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Table 3
U.S. Steel Hexavalent Chromium Spill ER
Sediment Sample Results Summary Table

Analyte	EPA RML (Residential Soil)	USS-SS-WB01-041217	USS-SS-WB01-041317	USS-SS-WB01-041417	USS-SS-WB01-041517	USS-SS-WB01-041617	USS-SS-WB01-041717	USS-SS-WB01-041817	USS-SS-WB01-041817-D
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Hexavalent Chromium	30	0.4 U	0.4 U	2 U	2 U	1.9 U	2 U	1.9 U	2 U
Chromium	NC	NA	NA	3.5	3.9	3.8	1.8	7.4	3.8

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

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Table 3
U.S. Steel Hexavalent Chromium Spill ER
Sediment Sample Results Summary Table

Analyte	EPA RML (Residential Soil)	USS-SS-WB02-041217	USS-SS-WB02-041317	USS-SS-WB02-041417	USS-SS-WB02-041517	USS-SS-WB02-041617	USS-SS-WB02-041617-D	USS-SS-WB02-041717	USS-SS-WB02-041817
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Hexavalent Chromium	30	0.4 U	0.4 U	2 U	2 U	2 U	2 U	2 U	2 U
Chromium	NC	NA	NA	4.6	3	1.6	3.3	1.8	2.4

Notes

NA Not Analyzed

NC No Criteria

mg/kg Milligrams per kilogram

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APPENDIX C
FIELD LOG BOOK NOTES



Name _____

Address _____

Phone _____

Project US Steel Hex Ct Release
CH211

७



RiteintheRain.com

CONTENTS

[illegible]

186 2445

US STEEL - HEX CHAIN STILL 4/11/17

1420 - START (BUTIN) ARRIVES ONSITE.
OSC MAGNIE (EPA) ONSITE +
OTHER AGENCIES; AT OUTFALL
1430 - OUTFALL HAS GREEN TINT FROM
CP6+ BREAKTHROUGH

1445 - COLLECT WATER QUALITY (WQ) @
OUTFALL 004
PH = 7.20 S.U.

CONDUCTIVITY = 322 $\mu\text{S}/\text{cm}$

TEMP = 12.58 °C

DO = 19.5 mg/L

ORP = -18.6 mV

1455 - COLLECT GRAB SAMPLE FROM
OUTFALL 004

ID: USS-SW-001-041117

1500 - MOVE TO US STEEL ENVIRONMENT
BUILDING FOR MEETING

1510 - ~~ISS~~ US STEEL SHW CP6+
BREAKTHROUGH @ ~ 0900; FOUND
SOURCE (LEAK IN PIPE) TO
DRAINAGE BASIN TO WWT (OTH ONLY)
 Cr (TOTAL)
~~ETOH~~ OUTFALL = 2.4 mg/L
 Cr @ LAKE = ND mg/L
SODIUM TRITHIOCARBONATE TO
BE MIXED TO CREATE →

4/11/17

1510 - TRIPLE CHROMIUM + PRECIPITATE

1515 - NEED TO BEGIN SAMPLING;
AND SAMPLE NEAR INTAKE

1620 - SAMPLING IN CHANNEL AREA
TO BE ANALYZED @ US
STEEL LAM FILL THE NIGHT
TAKING WQ READINGS

1625 - WQ A7/A2/A1 - ~ 2000 FT S
PH = 7.68 S.U. SPC = 474 $\mu\text{S}/\text{cm}$
TEMP = 14.3 °C ORP = -19.3 mV
DO = 10.72 mg/L

1630 - WQ B3/B2/B1 - ~ 800 FT S
PH = 7.84 S.U. SPC = 463 $\mu\text{S}/\text{cm}$
TEMP = 14.3 °C ORP = 51.4 mV
DO = 9.63 mg/L

1640 - WQ C3/C2/C1 - @ OUTFALL 7
PH = 7.84 S.U. SPC = 480 $\mu\text{S}/\text{cm}$
TEMP = 14.27 °C ORP = 11.1 mV
DO = 9.11 mg/L

1650 - GOING BACK TO BUILDING
TO DROP OFF SAMPLES
+ MEET W/ OTHER TEAMS

1700 - ARRIVE @ BUILDING, WAITING
FOR TEAMS TO ARRIVE

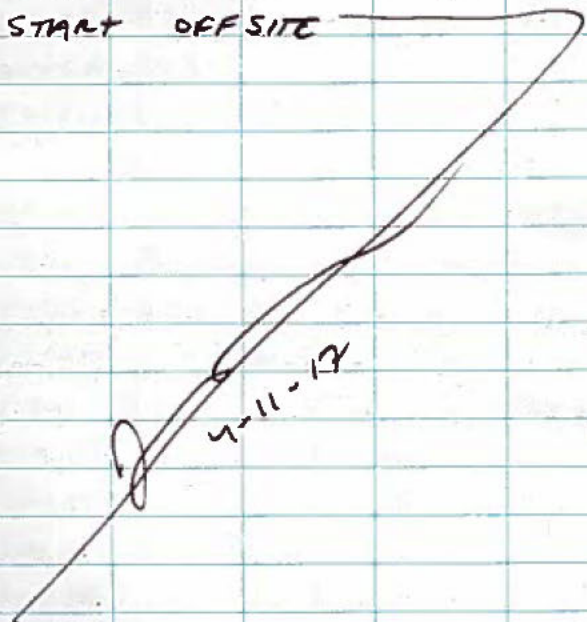
Rite in the Rain

4/11/17

1810 - OSC MAGUIRE ASKING US STEEL
TO GIVE SDS FOR
SODIUM TRITHIO CARBONATE +
DESCRIPTION OF PROCESS +
HOW SOURCE LEAKED

1815 - ATSDA INGESTION = 6 $\mu\text{g}/\text{L}$
NOMA ECOLOGICAL = 20 $\mu\text{g}/\text{L}$ @ OUTFALL

2000 - START OFF SITE



4/12/17

0915 - STATE (BUTTON + HOWLE) ARRIVE
ONSITE; EPA, APS, LOCAL
POLICE, IDEM, USS STEEL,
+ AM. WATER ONSITE

1040 - BUTTON TO SAMPLE
BURNS DITCH + LAKE

1055 - WQ @ A1/A2/A3

Temp = 13.2°C

PH = 6.57

SPC = 424 $\mu\text{S}/\text{cm}$

ORP = 85 mV

DO = 8.66 mg/L

COLLECT SAMPLE

1055 - 10: USS-SW-A001-A/B-041217

1057 - 10: USS-SW-A002-A/B-041217

1059 - 10: USS-SW-A003-A/B-041217

MOVE TO LOCATION B

1112 - WQ @ LOCATION B

Temp = 13.26

DO = 8.22

PH = 7.58

ORP = 73.4

SPC = 426

1114 - 10: USS-SW-B001-A/B-041217

1117 - 10: USS-SW-B002-A/B-041217

1118 - 10: USS-SW-B003-A/B-041217

Rite in the Rain

4/12/12

1130 - WQ @ R1/R2/R3

TEMP: 13.17 °C DO: 8.64 mg/L

PH: 7.34 ORP: 116.3 mV

SPC: 423 ms/cm

1140 - USS-SW-9003A/B - 041217

1143 - USS-SW-9003A/B - 041217

1130 - USS-SW-9001A/B - 041217

1129 - USS-SW-F001A/B - 041217

1148 - USS-SW-F002A/B

1148 - USS-SW-F003A/B

1138 - USS-SW-H003A/B

1135 - USS-SW-H002A/B

1132 - USS-SW-H001A/B

1151 - USS-SW-E003A/B

1154 - USS-SW-E002A/B

1156 - USS-SW-E001A/B

1158 - USS-SW-D001A/B

1202 - USS-SW-D002A/B

1204 - USS-SW-D003A/B

1209 - USS-SW-C003A/B

1211 - USS-SW-C001A/B

1213 - USS-SW-C002A/B

MSMSD

1315 - move to AREA NEAR BURNS
DITCH TO SAMPLE

1320 - USS-SW-002A/B

500 yds WEST

1330 - USS-SW-003A/B

300 yds FROM INLET

BACKNOTE: 1240 - COLLECT SAMPLE @
INTAKE. 10' USS-SW-INTAKE-A (XDP)

1340 - USS-SW-004; 250 yds EAST

1810 - GIVEN SAMPLE BY AM WATER
FLAN GUNNET WELL

Rite in the Rain

4/13/17

0930 - STAFF ARRIVES ON-SITE, EPA, NPS,
Am. WATER, & IDEM ALSO ON-SITE

1100 - BEGIN SAMPLING IN CANAL
USS-SW-A003-A/B - 041317 *003-A-D

1105 - -SW-A002-A/B

1108 - -A001-A/B

1115 - -B003-A/B *003-B-D

1120 - -B002-A/B

1122 - -B001-A/B

1130 - -H001-A/B

1133 - -H002-A/B

1136 - -H003-A/B *HMSMSDs

1142 - -G003-A/B

1144 - -G002-A/B

1148 - -G001-A/B G001-B-D

1150 - -F001-A/B F001-B-D

1154 - -F002-A/B

1158 - -F003-A/B F003-A-D

1202 - -E003-A/B

1206 - -E002-A/B *HMSMSDs

1210 - -E001-A/B

1210 - USS-SW-D001-A/B

1214 - -D002-A/B

1218 - -D003-A/B

1222 - -C003-A/B

1226 - -C002-A/B

1230 - -C001-A/B - 041717 *A-D ^{SW}

1233 - BEGIN HEADING TO INTAKE PIPE

1243 - USS-SW-INTAKE-A/B-041317 A-D ^{SW}

HEAD BACK TO COLLECT

SAMPLES NEAR ENTRANCE OF

BURNS DITCH 1/3

1255 - COLLECT SAMPLES NEAR ENTRANCE

USS-SW-002 A/B-041317 A-D ^{SW}
B-D ^{SW}

500 yds FROM ENT WEST

1305 - USS-SW-003 A/B-041317

250 yds ^{WEST} OF ENTRANCE - B-D ^{SW}

1315 - USS-SW-004 A/B-041317

250 yds EAST OF ENTRANCE

1325 - USS-SW-005 A/B-041317 - B-D ^{SW}
TU

500 yds EAST OF ENTRANCE

Return to the Rain.

4/14/17

- 0840 - START (BUTTON, HOWLE, McNamee)
ARRIVE ONSITE. WEATHER: 48° Mostly
Cloudy, E 9mph wind, 30% chance of rain
- 0915 - Morning meeting to discuss start up
plan / work plan for the day. EPA, UPS,
FIDEM all on site.
- 1020 - Begin sampling near entrance of
Burns ditch.
Collect Samples near entrance
- 1030 USS-SW-003 A/B - 04/14/17
250 yards West of entrance
- 1035 USS-SW-002 A/B - 04/14/17
500 yards West of entrance
- 1040 USS-SW-006 A/B - 04/14/17
1/4 mile from shore (1)
~~USS-SW-007 A/B - 04/14/17~~ UN
WQ @ 006
Temp: 17.44 pH: 7.26
DO: 17.25 Cond: 137
ORP: 79
- 1050 USS-SW-007 A/B - 04/14/17
- 1100 USS-SW-Intake A/B - 04/14/17
- ~~1115~~ USS-SW-004 A/B - 04/14/17 - DPA
1213 250 yards East of entrance
Battery for Per. pump died. Back to
Shore to pick up new one

4/14/17

- USS-SW-005 A/B - 04/14/17
500 yards East of entrance
Began sampling 1/2 mile from
shore @ new locations
- USS-SW-008 A/B - 04/14/17
1 1/2 mile from shore NE of entrance
- USS-SW-009 A/B - 04/14/17
1/2 mile N of entrance
- USS-SW-010 A/B - 04/14/17 "DPA
1/2 mile NW of entrance
- USS-SW-011 A/B - 04/14/17
1/2 mile out, W of SW-010
- USS-SW-012 A/B - 04/14/17
1/2 mile out, W of SW-011
- Backlog: 1215 WQ @ 010 E (SW-004)
Temp: 6.84 pH: 4.35
DO: 13.63 ORP: 63.3
Sp Cond: 180
- Backlog: 1242 WQ @ SW-010
Temp: 6.98 pH: 5.09
DO: 12.59 ORP: 52.3
Sp Cond: 180
- 1300 Began sampling ~~again~~ ^{with channel}
- 1310 USS-SW-A003 - A/B - 04/14/17

Return to the Rain

1313 USS - SW - A002 - A/B - 041417
 1315 - A002 - A/B - 041417 Dup B
 1325 - A003 - A/B
 1327 - B002 - A/B
 1329 - B001 - A/B
 1337 - H001 - A/B
 1337 - H002 - A/B Dup A
 1340 - H003 - A/B MS/MSD
 1346 - G003 - A/B
 1348 - G002 - A/B
 1352 - G001 - A/B
 1354 - F001 - A/B Dup B
 1356 - F002 - A/B
 1358 - F003 - A/B
 1402 - E003 - A/B
 1404 - E002 - A/B
 1407 - E001 - A/B Dup A
 1409 - D001 - A/B
 1413 - D002 - A/B
 1415 - D003 - A/B
 1418 - C003 - A/B
 1420 - C002 - A/B Dup B
 1422 - C001 - A/B MS/MSD
 1500 Returned to command Post for Sample Prep

4/15/17

1005 Depart Dock - START B. Croft, IN Amund
 Marsh, ALS

1029 USS - SW - INTAKE A/B - 041517
 1037 007 A/B
 1044 006 A/B
 1049 002
 1053 003
 1132 004
 1136 005
 1150 008
 1158 009
 1203 010
 1208 011
 1215 012

1250 @ Dock to transfer samples to START
 Justin B.

4/15/17

Rite in the Rain

4/15/17

SW-008 WQ

temp = 6.74

DO = 15.63

sp. cond = 167

pH = 8.3

ORP = 33.6

BSC 4/15/17

4/15/17

1320 leave dock to return sampling

1328 USJ-SJ-A-003-A/B-041517

1329 A 002

1329 A001

1338 B003

1340 B002

Dup A

1342 B001

1348 H001

1351 H002

1353 H003

1355 G003

1357 G002

1359 G001

~~1405~~ 1401 F001

1403 F002

1405 F003

1411 F001

1409 E002

1407 E003

1413 D001

1415 D002

1417 → D003

1423 → C001

1421 → C002

1419 → C003

→ DUC A

→ DUC B

→ m2/m2WB

BSC 4/15/17 the Rain

4/15/17

~~4/15/17~~

1445 return to dock

1510 @ US Steel slaying area
begin processing samples

2030 offsite

BSC 4/15/17

4/16/17

0730 depart dock w/ ALS Brd, IN American Letter
Kangas, & Heritage (2)

0755 USS-SW-INTAKE A/B-011617

0758 001 A/B

0801 004 A/B

0804 002 A/B

DUP A

0808 003 A/B

0845 004 A/B

0848 005 A/B

DUP B

0851 008 A/B

0858 009 A/B

MS/SD A

0901 010 A/B

0915 011 A/B

MS/SD A

0925 012 A/B

A00

A003

A002

A001

BSC 4/16/17

Rite in the Rain.

18 4/16/17

0950

0958² W-SW - A003-041617

ms/msd A

0952

A002

0954

A001

0957

B002

ms/msd A

0959

B002

Dup-B

1001

B001

1013

H001

1015

H002

1017

H003

1020

G003

1022

G002

1024

G001

1027

F001

1030

F002

1033

F003

1036

E003

1039

E002

1042

E001

1045

D001

1048

D002

Dup-A

1051

D003

1054

C001

1057

C002

1100

C003

BSC 4/16/17

4/16/17

19

1125 return to dock

1145 @ staging area - begin sample processing

1530

offsite

BSC 4/16/17

Rite in the Rain

4/17/17

2222 - CCM 4/17/17

0815 @ US Steel staging area

0925 depart dock → Heritage (2), ALS (Red)
- no Int American Water rd

0945 USS-SW-004-041717 A/B

0948 005

0951 008 ms/msd A

0954 009

1000 010

1007 011

1017 012 ms/msd A

1020 1000 DUF A

1027 007

1048 006

1051 002

1053 003 DUF-A

BSC 4/17/17

4/17/17

1057 USS-SW-A003-041717 A/B

1059 A002 ms/msd-A

1101 A-001

1106 B003

1108 B002 ms/msd-A

1110 B001

1121 H001

1123 H002 DUF-A

1125 H003

1128 G003

1131 G002

1134 G001

1137 F001

1140 F002

1143 F003

1146 E003

1149 E002

1152 E001

1155 D001

1157 D002

1159 D003

1201 C001

1203 C002

1205 C003

BSC 4/17/17

Rite in the Rain

4/17/17

1230 @ USS Steel staging area

begin processing samples

1640 complete sample processing - ascent critical of
Pace couriers

1700 meeting @ USS Steel staging / office

1750 samples to courier

1800 offsite

BSC 4/17/17

4/18/17

0805 onsite @ USS Steel staging / office

0935 depart dock

0946 USS-SW-004-041817 A/B

0949 005

0954 008

0957 009

1000 010

1003 011

1006 012

1009 INTAKE

1030 007

1033 006

1036 002

1039 003

MS/MSD-A

MS/MSD-A

DUP-A

DUP-A

24 4/18/17

1056 USS-SJ-A003-041817 A/B

1059 A002

1102 A001

1110 B003

1112 B002

1114 → ~~B001~~

1124 H001

1126 H002

1128 H003

1130 G003

1132 G002

1134 G001

1136 F001

1138 F002

1140 F003

1142 E003

1144 E002

1146 E001

1148 D001

1150 D002

1152 D003

1154 C001

1156 C002

1158 C003

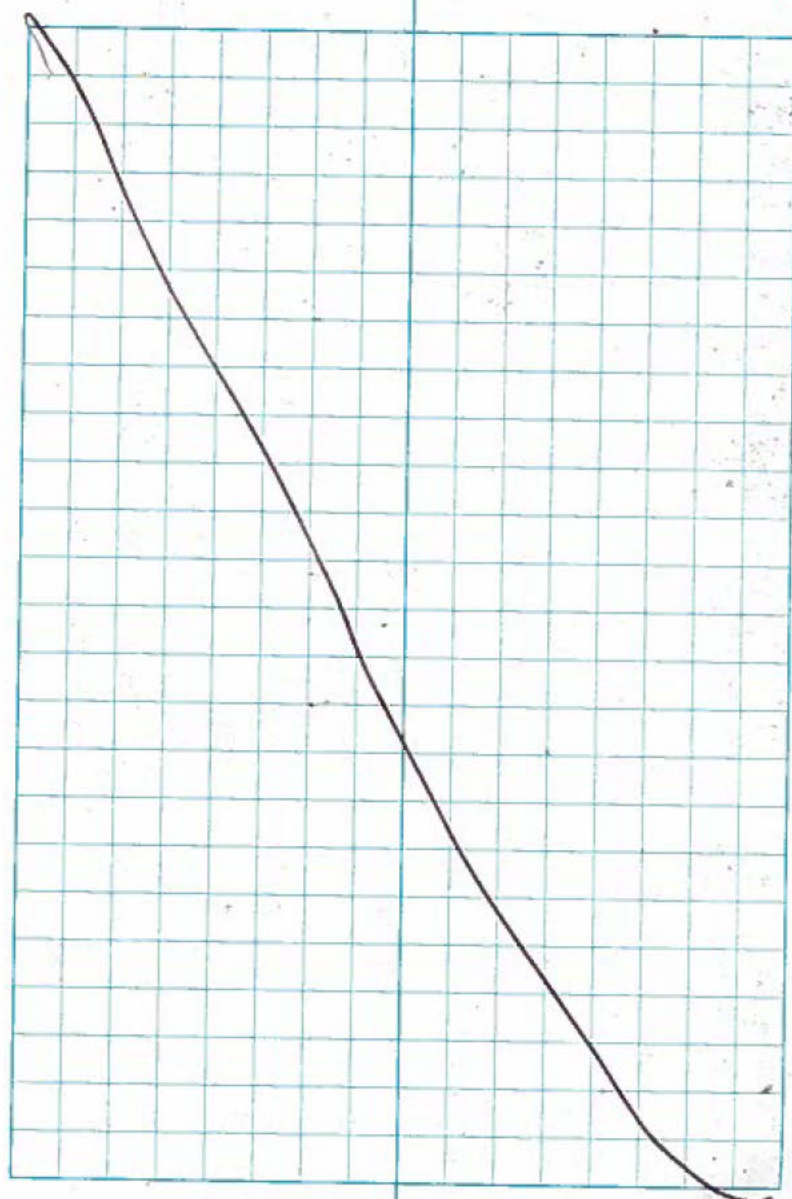
DUP-A

MS/MSD-A

MS/MSD A

DUP-A

25



Rite in the Rain

— SINCE 1918 —
Rite in the Rain®

== DEFYING MOTHER NATURE ==

Name _____

Address _____

Phone _____

Project US Steel REXC Release

US Steel Hex Cr Release
CH212

RiteintheRain.com



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CONTENTS

[illegible]

4/12/12

- 10:00 Sampling meeting
- Additional sampling at wet well and right outside harbor entrance: north break wall. And mid-depth samples at locations from yesterday
 - 1) harbor entrance
 - 2) north shore beyond break wall (2)
 - 3) Additional east point near public access beach

Beach sample

- offshore (10 ft)
- wadable (4 ft) sediment sampling
- shore
- Ogden dunes area, portage lakefront, west beach
- fire dept NPS NPS
- All NPS beaches to Mich. city closed to east, bath house to west on west beach

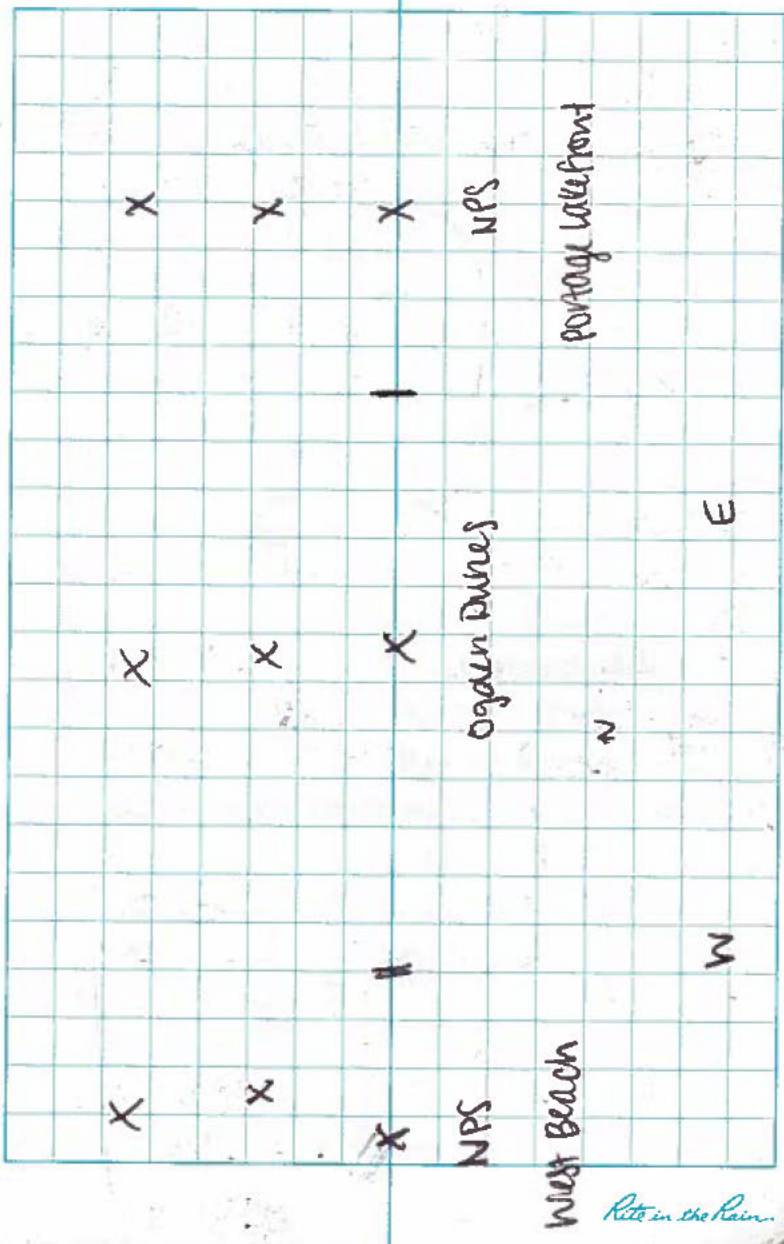
Singles

- 1) Eddy zone
- 2) North break (2)
- 3) East of US Steel

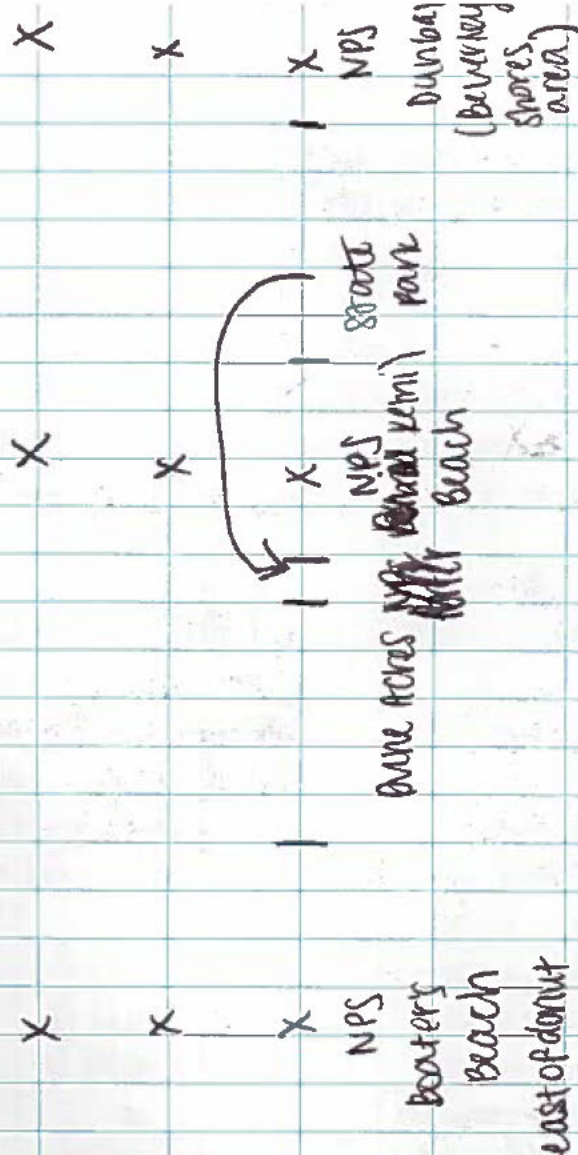
Triplicates

- 1) West Beach
- 2) Ogden
- 3) Portage waterfront
- 4) Boater's Beach
- 5) ~~Portage~~ Kemil
- 6) Dunbar
- 7) Porter

US Steel 3



Rite in the Rain



00SD1N

- Dead Fish

- Slightly below surface
- count, size, location

- Stainless steel scoop
- stainless steel bucket
- glassware

- No obstructions to boat 10 feet out

Lab Info

Cr⁶⁺

24 hr

unfiltered

untreated

MDL 2 mg/L

Cr total

180 days

unfiltered or filtered

Nitric Acid

RL 4 mg/L

11:00 Data mgmt meeting

Unique sample ID

GPS

Date

Time (sample)

Time (lab run)

method/detection

Rite in the Rain

- 12:30 Arrive at NPS station to get gear
 13:00 head out with Greg from US Steel
 and Joe from NPS
 13:10 Arrive to Dunbar DB
 N 41° 41.026
 W 87° 00.214
 13:25 collect wave zone sample
 13:40 collect 4" sample
 13:50 Arrive at Kumil KB
 N 41° 40.909
 W 087° 00.596
 13:55 collect shore sample
 14:00 collect wave zone sample
 14:20 Arrive at Porter PB
 N 41° 39.661
 W 087° 04.162
 14:25 collect shore sample
 14:30 collect wave sample
 15:15 Arrive at Batters Beach BB
 N 41° 39.000
 W 087° 06.492
 15:25 collect shore sample
 15:30 collect wave sample

- 16:15 Arrive at West beach WB
 N 41° 37.584
 W 087° 12.484
 16:25 collect shore sample
 16:30 collect wave sample
 16:50 Arrive at Caden beach OD
 N 41° 37.078
 W 087° 11.909
 17:00 collect shore
 17:05 collect wave
 17:15 Arrive at Portage Lakefront PL
 N 41° 37.835
 W 087° 10.828
 17:25 collect shore sample
 17:35 collect wave sample
 17:45 Arrive back at US Steel
 to process samples

Naming for sed. samples

USS-SS-DB01-041217

DB - Location (Dunbar beach)

01 - sample zone

01 - shoreline

02 - wave zone

17:50 Leaving from site

Rite in the Rain

8 4/13/17

- 19:30 arrive on site
 2:30 leave site for NPS station
 1:15 arrive at Dunbar beach DB
 41°41.055'
 087°00.228'
 1:25 collect shore sample
 1:28 collect water samples
 1:35 collect waste samples
 1:45 arrive at Kemis beach KB
 41°41.055'
 087°00.228'
 1:50 collect shore sample
 1:52 collect water samples
 1:55 collect waste samples
 12:15 arrive at porter beach PB
 41°39.661
 087°04.167
 12:20 collect shore
 12:22 collect water
 12:24 collect waste
 13:20 arrive at boaters beach BB
 41°39.004
 087°06.470
 13:22 collect shore and dump
 13:20 collect water and dump

9

- 13:30 collect waste and dump
 14:25 arrive at west beach WB
 N 41°37.584
 W 087°12.479
 14:30 collect shore
 14:34 collect water
 14:38 collect waste
 15:05 arrive at oyster dunes
 ABC7 chicago present → OD asked about water quality, # of samples
 41°37.673
 087°11.924
 15:10 collect water samples
 15:14 collect shore sample
 15:20 collect waste
 16:40 arrive at Portage Lakefront PL
 15:45 collect water
 15:50 collect shore
 15:52 collect waste
 41°37.836
 087°10.821
 18:30 leave camp from site

Rain the Rain

4/14/17

8:30 START onsite for morning meeting
 9:00 morning meeting, adding new sample points
 in lake ^{golden dunes}
 11:15 Arrive to ~~West~~ beach OD WB
 Red → unprocessed
 pink → preserved
 11:22 collect shore sample
 11:26 collect water
 11:35 collect waste
 11:55 Arrive at west beach WB
 12:00 collect shore
 12:05 collect water → DWP
 12:10 collect waste → 12:35 shore pl
 12:35 Arrive at portage → 12:39 waste
 13:10 Arrive at sunbar → 12:45 water
 13:15 collect shore sample DB
 13:19 collect water samples
 13:25 collect waste samples
 13:30 Arrive at Kerrick
 13:35 collect water
 13:38 collect shore
 13:40 collect waste
 13:55 Arrive at Porter
 14:00 collect shore
 14:04 collect waste

14:08 collect water
 14:55 Arrive at Porters
 14:58 collect shore
 15:00 collect waste
 15:02 collect water

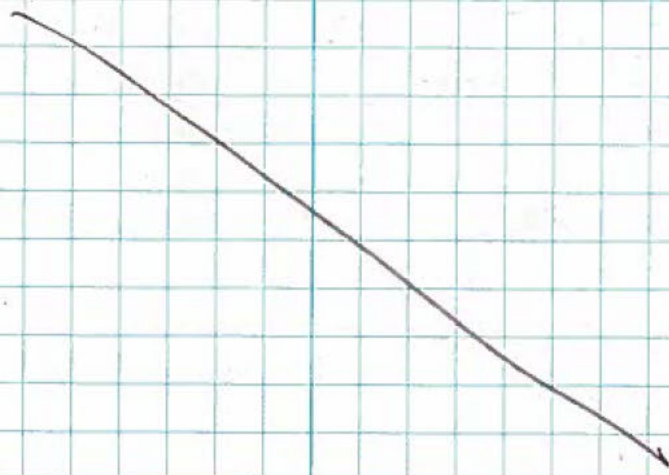
Total samples per location:

2 sed

4 Water (1 US, 1 SPA, 2 NPS)

15:30 Arrive back on base (US stored)
 for sample processing

19:00 START Demob.



Rite in the Rain

Sample order

- 1) West Beach
- 2) Ogden Dunes (to the east in front of orange boat)
- 3) Portage Lakefront
- 4) Dunbar Beach
- 5) Kemil beach
- 6) Porter beach (to the left just inside of posts)
- 7) Boaters beach

4/15/17

0815 : START (McCarrell, Knox, Butchings)
 ON SITE for morning meeting.
 WEATHER: 66°, Mostly Sunny, SW 13 mph
 Wind, 10% chance of rain.
 - USS Steel back up & running.
 - Hits of Hex Cr in waterway &
 Ditch + Lake + 1 Sediment sample
 @ Portage Lakefront. Sample
 temp high, may not be usable
 - Continue sampling from EPA,
 US Steel, & Indiana Water

1015 Began Sediment Sampling
 1030 Arrive @ West Beach (WB)
 1110 Collect Shore + Water
 1118 Collect water
 1140 Arrive @ Ogden Dunes (OD)
 1150 Collect Shore (D) + water + DUP
 1155 Collect water
 1220 Arrive @ Portage Lakefront (PL)
 1227 Collect shore
 1230 Collect water
 1227 Collect water
 1300 Arrive @ Dunbar Beach (DB)
 1310 Collect Shore

Return to the Rain.

4/15/17

- 1315 Collect waste @ dunbar
 1316 Collect water @ dunbar + Duplicate
 1328 Arrive Kumil beach KB
 1333 Collect shore
 1340 Collect waste
 1333 Collect water
 1406 Arrive @ Porter Beach PB
 1413 Collect shore
 1416 Collect waste + Duplicate
 1413 Collect water
 1432 Arrive @ Boaters Beach BB
 1455 Collect shore + MS/MSD
 1500 Collect waste
 1455 Collect water
 1530 Return samples & equipment to
 NPS headquarters
 1545 Return to US Steel Mill/Command Post

4/16/17

- 8:06 leave Command for
 Sampling
 8:50 Arrive at DB
 8:55 collect shore
 collect water
 8:58 collect waste
 9:05 Arrive at Kumil
 9:08 collect shore/water
 9:11 collect waste
 9:25 Arrive at Porter
 9:30 collect shore
 collect water - D
 9:32 collect waste
 10:30 Arrive at Boaters
 10:31 collect shore - D, water
 10:33 collect waste
 11:15 Arrive at WB
 11:18 collect shore/water
 11:20 collect waste - D
 11:45 Arrive at OD
 11:46 collect shore/water
 11:48 collect waste

17:08 Arrive at PL
 12:16 Collect shore/water - MS/MSD
 12:12 collect waste
 15:20 Demolish.

4/17/17

8:15 START arrive on site (Houle, Croft, Knox)
 Weather: 67°, partly cloudy, N wind 4 mph,
 0% chance of rain

9:00 Morning meeting

Operations all stable at on-site WTP.
 any issues w/ chrome plant should be detected
 before 5 o'clock meeting

10:20 Leave Ranger Lab for beach (Dunbar)

10:30 Arrive at DB

10:39 collect shore - dup

10:42 water, waste

10:53 Arrive at KB

10:59 collect shore/water

11:00 collect waste

11:15 Arrive at Portage

11:20 collect water, waste

11:23 collect waste-D

11:54 Arrive at Boaters

11:58 collect shore/water

12:01 collect waste

12:37 Arrive at West Beach

12:45 collect shore/water-D

12:48 collect waste

13:00 Arrive at Ogden Dunes

13:13 collect water/shore

13:16 collect waste

13:31 Arrive at Portage

13:38 collect shore/water

13:41 collect waste

Collected samples w/ Brandon (ALS) and
 Joe (NPS)

13:50 Arrive on site to process samples

17:00 5 o'clock meeting

Parks reopening tomorrow, pH and
 spec. conductivity going up again,
 Ogden dunes and Indiana water
 showing for tomorrow too

US steel chrome lines up and running,
 24-hr monitoring until tomorrow day.

Final release data from USS letter to
 IDEM

- 349 lbs Total Cr

- 298 lbs Hex Cr

9 am meeting tomorrow, timing for last day

4/18/17

8:00 START on site (Swilik, Houle, Croft)

9:00 morning meeting

Beaches all open, Ogden opening today,
same sampling as yesterdayWeather: 74°, clear, wind 5 mph N,
No chance of rain10:00 head out from Ranger Station with
Brandon (ALS)

10:20 Arrive at West beach

10:27 water, shore-D

10:30 wade

10:49 Arrive at Ogden dunes

10:54 ~~Arrive~~ Collect water, shore

10:57 Collect wade

11:09 Arrive at Portage

11:14 Collect Shore, water-D

11:17 collect wade

11:45 Arrive at Porter beach

11:52 collect shore/water

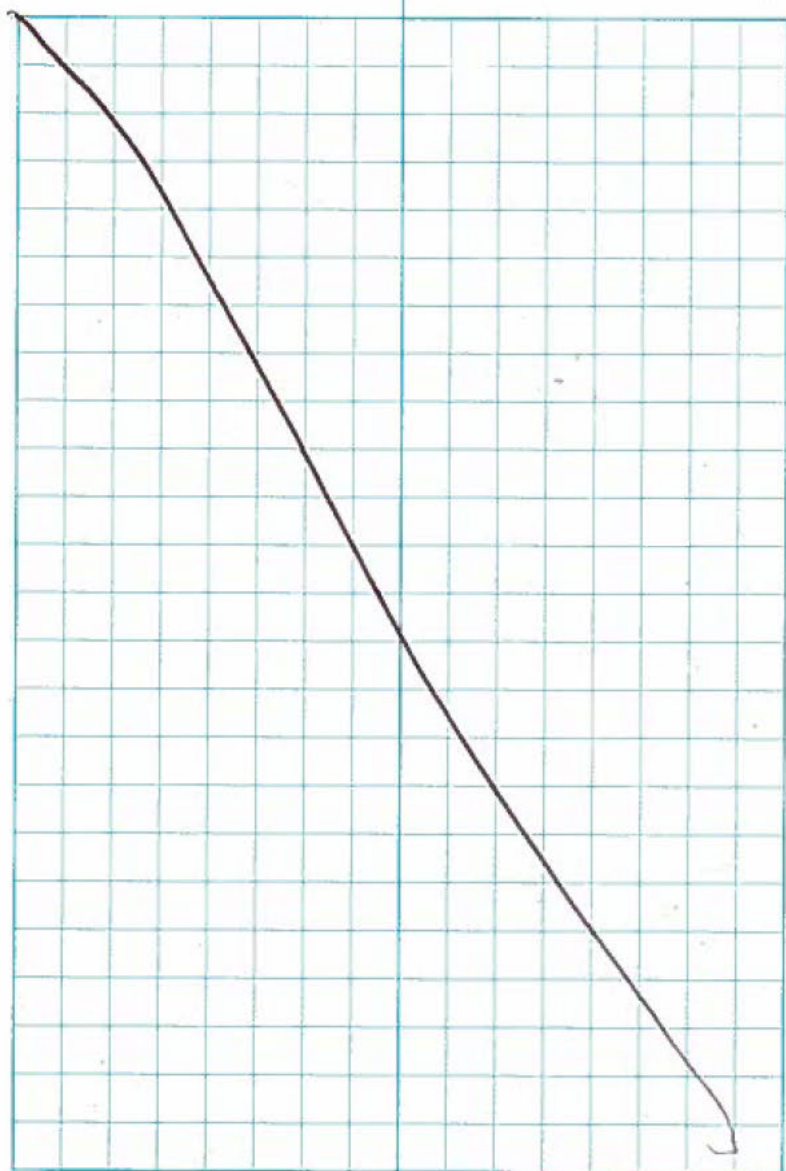
11:55 collect wade-D ← Porters
Beach

12:34 collect shore, water

12:37 collect wade

Kemi and Dunbar closed due to NPS
controlled burn did not sample

13:20 Arrive back at US Steel to process



RHI

Rite in the Rain

Name _____

Address _____

Phone _____

Project VS Steel Hex Cr Release
CH213



RiteintheRain.com

CONTENTS

[illegible]

2 4/14/17 Outfall monitoring
outflow w/ YSI 0041

1300

Upstream (500 ft south of outfall)

Temp 13.9

DO% 85.6

DO mg/L 8.77

Cond. 537

PH 7.84

At outfall

Temp 14.4

DO% 88.7

DO mg/L 9.0

Conductivity 625

PH 7.90

Downstream (500 ft north of outfall)

Temp 13.9

DO% 83.5

DO mg/L 8.64

Cond. 568

PH 7.86

1330

Test at outfall for plant start

Temp 14.1 Background

DO% ~~74.9~~ 85.1

DO mg/L 8.70

Cond. 602

PH 7.87

4/14/17

1339

Temp 14.0

~~Temp 14.1~~

DO% 86.8

DO mg/L 8.79

Cond. 544

PH 7.91

100ft Downstream of outfall near mouth
opening of canal

1341

Conductivity varies between 600 & 760
directly below outfall (north)

1344

Temp 14.0

DO% 84.8

DO mg/L 8.47

Cond 542

PH 7.90

Upstream, conductivity drops to 500s south
of outfall

Conductivity mid 500s western side of canal

1348

Temp 14.1

DO% 85.4

DO mg/L 8.93

Cond 696

PH 7.89

at outfall

Rite in the Rain

4/14/17

Conductivity ranges from 530 to 719 moving north directly past outflow

1350

conductivity ranges between mid 500s + 610, peaking at outflow moving south past outflow

1356 at outflow

Temp 14.1

DO% 85.1

DO_L 8.74

cond. 546

pH 7.92

DO peaks at 90% at outflow

Temp 14.4

DO% 84.5

DO_L 8.96

cond. 656

pH 7.97

1401 out below outflow (north)

1410 put boom down at outflow

above outflow (south)

Temp 13.8

DO% 85.5

DO_L 8.83

cond. 528

pH 7.92

4/14/17

1417 below outflow (north)

Temp 14.3

DO% 89.9

DO_L 9.00

cond. 767

pH 7.97

100 feet north of outflow

Temp 14.1

DO% 86.4

DO_L 8.94

cond. 574

pH 7.96

1425

Temp 14.2

DO% 84.8

DO_L 8.69

cond. 548

pH 7.92

100 feet south of outflow

1427 at outflow moving north

Temp 13.9

DO% 82.4

DO_L 8.28

cond. 656

pH 7.91

6 4/14/17

NE

1432 north corner of bay

Temp 14.5

DO% 92.7

DO mg/L 9.29

Cond. 561

pH 7.95

Temp 14.1

DO% 85.7

DO mg/L 8.77

Cond. 561

pH 7.93

mouth of bay to Lake

1438 100 ft south of outflow

Temp 14.2

DO% 85.7

DO mg/L 8.76

Cond. 541

pH 7.93

1444 just north of outflow

Temp 14.6

DO% 92.1

DO mg/L 9.12

Cond. 606

pH 8.00

4/14/17

1448 across from outflow on west side of Channel

Temp 14.5

DO% 87.6

DO mg/L 8.94

Cond. 614

pH 7.99

1500 Temp 14.4 100 ft. south of outflow

DO% 84.9

DO mg/L 8.69

Cond. 547

pH 7.95

1503 at outflow

Temp 14.9

DO% 86.6

DO mg/L 8.65

Cond. 619

pH 7.95

1507 middle of bay

14.3

85.9

8.70

549

7.94

Rite in the Rain

8 1510 West channel across from output
4/14/17

14.5 Temp
85.8 DO%
8.72 DO mg/L
553 conductivity
7.95 pH

1525 at outflow

14.8 Temp
84.8 DO%
8.66 DO mg/L
544 conductivity
7.95 pH

1540 upstream point

14.3 Temp
86.7 DO%
8.80 DO mg/L
549 cond.
7.95 pH

1545 north of outflow

Temp 14.3
DO% 89.6
DO mg/L 9.17
cond. 538
pH 7.98

4/14/17

1550 Northeast corner of bay

Temp 14.4
DO% 86.8
DO mg/L 8.75
cond. 558
pH 7.96

1600 at output

Temp 14.3
DO% 82.8
DO mg/L 8.45
cond. 566
pH 7.97

1630 upstream point

Temp 14.5
DO% 89.3
DO mg/L 9.08
cond. 549
pH 7.99

1640 at outflow

Temp 14.6
DO% 88.5
DO mg/L 9.00
cond. 544
pH 7.98

Rite in the Rain.

10 4/14/17

middle of Bay 1850

Temp 14.5

DO% 88.3

DO mg/L 9.00

Conduc. 548

pH 7.98

1700 Just north of outflow

Temp 14.7

DO% 89.0

DO mg/L 9.02

Conduc. 565

pH 8.05

opening to Bay 1810

Temp 14.4

DO% 89.3

DO mg/L 9.10

Conduc. 544

pH 7.99

outflow 1720

Temp 14.4

DO% 90.7

DO mg/L 9.21

Conduc. 550

pH 8.07

4/14/17

1735 Northwest corner of bay (opening to lake)

Temp 14.6

DO% 88.8

DO mg/L 9.02

Conduc. 555

pH 7.98

1745 at outflow

Temp 14.4

DO% 87.6

DO mg/L 8.92

Conduc. 542

pH 8.00

1800 Boat docked

1900 off site

4/14/17

LH

Rite in the Rain

4/15/17 75% sunny

0815 START on site

EPA already on site

0900 monitoring water quality at
plant outflow with YSI from
platform and boat1000 Measure at outflow - ^{at bottom of}
boom saturated
with oil

Temp 16.5

DO% 81.4

Conductivity 722

pH 8.27

1015 at outflow

Temp 16.6

DO% 82.7

Cond. 728

pH 8.24

1025 at outflow

Temp 16.7

DO% 80.3

Cond. 750

pH 8.33

1040 at outflow

Temp 16.5

DO% 81.5

Cond 688

pH 8.21

4/15/17

1050 at outflow

Temp 16.6

DO% 80.0

Cond. 710

pH 8.19

1100 ← monitor from boat

1110 Point B (500 ft south of outflow)

Temp 15.6

DO% 82.5

Cond. 571

pH 7.94

1115 Point C (outflow)

Temp 15.7

DO% 81.1

~~571~~ 612

7.97

1120 Point D (entrance to bay)

15.6

81.5

571

7.93

1125 Point E

15.6

82.5

572

7.92

Rite in the Rain

14 1130 4/15/17

Point F

Temp 15.8

DOP% 81.4

Cond. 574

PH

1135 7.93

Point G (southern part of bay)

15.9

83.6

575

7.95

1200 monitor from outfall platform

1210 at outflow

Temp 17.2

DOP% 80.9

Cond. 699

PH 8.20

1220

17.4

79.3

700

8.19

orange algal-like ~~mat~~ ^{bio} mat leaving
outflow, confirm w/ US steel environ
personnel that just algal growth
in pipe, not from plant

15

4/15/17

1230 at outfall

17.8

76.5

732

8.22

1240 at outfall

17.6

77.8

710

8.20

1250 at outfall

17.8

77.3

669

8.18

1300 monitor from boat

1310 Point B

15.9

85.1

576

7.98

1315 Point ~~B~~ ^C

16.1

86.1

580

7.96

Rite in the Rain

1320

7/15/17

Point ~~E~~ D

14.1

84.9

583

7.95

1325 Point E

16.1

85.7

583

7.96

1330 Point F

16.2

84.9

584

7.96

1335 Point G

16.9

91.5

588

8.02

1400 monitor from outfall platform

1410 at outfall

Temp 17.9

DO% 79.6

cond. 672

pH 8.28

7/15/17

weather: windy

1420 at outfall

Temp 18.0

DO% 78.0

Cond. 682

pH 8.19

1430 at outfall

Temp 17.9

DO% 78.7

cond. 696

pH 8.19

1440 at outfall

Temp 18.0

DO% 79.0

cond. 698

pH 8.22

1450 at outfall

Temp 18.0

DO% 76.1

cond 718

pH 8.29

1500 monitoring on boat

1510 Point B

Temp 16.5

DO% 88.6

Cond. 683

pH 8.04

Rite in the Rain

7/15/11

1515 Point C

Temp 16.4
DO% 89.5
cond. 571
pH 8.00

1520 Point D

Temp 16.5
DO% 90.1
cond. 584
pH 7.98

1525 Point E

Temp 16.5
DO% 89.4
cond. 591
pH 7.98

1530 Point F

Temp 16.5
DO% 88.7
cond. 589
pH 7.99

1535 Point G

Temp 17.3
DO% ~~88.2~~ 91.6
cond 595
pH 8.07

4/15/17

Weather: extremely windy water mixing at outfall

1600 monitor from outfall platform

1610 at outfall

Temp 17.1
DO% 84.3
cond. 591
pH 8.22

1620 at outfall

Temp 17.6
DO% 80.7
cond. 612
pH 8.26

1630 at outfall

Temp 17.2
DO% 82.0
cond 593
pH 8.25

1640 at outfall

Temp 17.5
DO% 81.8
cond. 599
pH 8.24

1650 at outfall

Temp 17.5
DO% 80.1
cond 595
pH 8.24

Rite in the Rain

4/15/17

1700 monitor from boat

1710 Point B

Temp 16.8

DO% 91.0

cond. 591

pH 8.06

1715 Point C

Temp 16.7

DO% 90.3

cond. 585

pH 8.03

1720 Point D

Temp 16.8

DO% 90.0

cond. 591

pH 8.02

1725 Point E

Temp 16.8

DO% 90.4

cond. 590

pH 8.02

1730 Point F

Temp 17.1

DO% 92.1

cond. 590

pH 8.07

4/15/17

Point G 1735

Temp 14.7

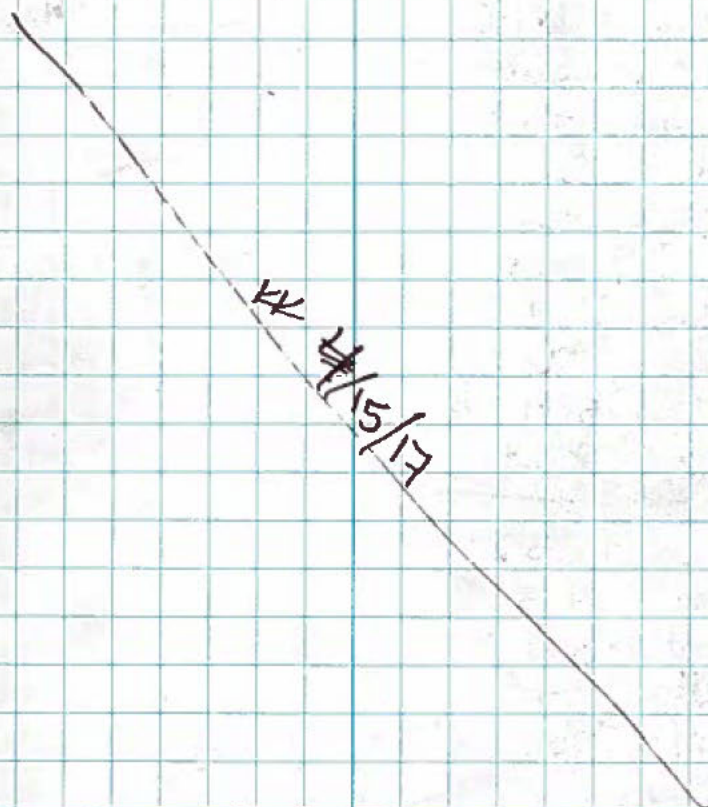
DO% 90.5

cond. 575

pH 8.03

1745 Boat docked

1945 offsite



Rite in the Rain

4/16/17 61°F, Sunny, 60% Cloudy
0700 START on-site (Craft, Swilik)

EPA already on-site

0830 monitoring water quality at
plant outflow with YSI (0041)
from platform at 004 with
Swilik (SPET) and Mendez
from EPA

Temp 17.4°C

DO% ~~76.3~~ 72.8%

Conductivity ~~657~~ 663 $\mu\text{S}/\text{cm}$

pH 8.14

1030 monitoring at boat
"Point G" (at marina)

Temp 17.4°C

DO 70.6%

Cond 545 $\mu\text{S}/\text{cm}$

pH 8.24

1035 ~~Point F~~ entrance to ditch/marina

Temp 17.3°C

DO 81.5%

Cond 600 $\mu\text{S}/\text{cm}$

pH 7.99

1045 Point C (at fall)

Temp 17.6°C

DO 80.1%

4/16/17

Cond 593 $\mu\text{S}/\text{cm}$

pH 8.04

1050 Point B (500 ft N of 004)
(entrance to bay)

Temp 17.4°C

DO 80.3%

Cond 611 $\mu\text{S}/\text{cm}$

pH 7.95

1055 "Point D" (~300 ft S of outfall 004)

Temp 17.4°C

DO 81.7%

Cond 599 $\mu\text{S}/\text{cm}$

pH 7.97

1100 "Point E" (next outfall S of 004)

Temp 17.4°C

DO 80.2%

Cond 565 $\mu\text{S}/\text{cm}$

pH 7.96

1105 "Point F" (next outfall from Point E)

Temp 17.4°C ~~Southernmost outfall~~
Southernmost outfall

DO 79.9%

Cond 595 $\mu\text{S}/\text{cm}$

pH 7.96

1100 Monitoring from boat
Swilik and Rob (security from USFees)

Rite in the Rain

4/16/17

1205 "Point G" (at Marina Shores sign)

Temp 17.5 °C

DO% 81.2

Cond 590 $\mu\text{S}/\text{cm}$

pH 8.14

"Point F" (at first bridge from

1210 marina and entrance to ditch)

Temp 17.4 °C

DO% 77.8 %

Cond 600 $\mu\text{S}/\text{cm}$

pH 8.04

1215 reading at green bridge (2nd one S.
of marina)

Temp 17.4 °C

DO ~~76.7~~ 78.5 %Cond 603 $\mu\text{S}/\text{cm}$

pH 8.06

1220 second outfall from marina

Temp 17.5 °C

DO 80.2 %

Cond 610 $\mu\text{S}/\text{cm}$

pH 8.01

1225 Outfall 004

Temp 17.5 °C

DO 78.9 %

4/16/17

Cond 610 $\mu\text{S}/\text{cm}$

pH 7.98

1230 Point B (500 ft S of 004)

Temp 17.4 °C

DO 80.5 %

Cond 601 $\mu\text{S}/\text{cm}$

pH 8.01

1245 Monitoring at outfall 004

1250 Temp 17.8 °C

DO 76.2 %

Cond 588 $\mu\text{S}/\text{cm}$

pH 8.10

1255 Temp 18.0 °C

DO 75.7 %

Cond 595 $\mu\text{S}/\text{cm}$

pH 8.06

1305

Temp 18.0 °C

DO 74.4 %

Cond 594 $\mu\text{S}/\text{cm}$

pH 8.07

1315 Temp 18.1 °C

DO 73.9 %

Cond 602 $\mu\text{S}/\text{cm}$

pH 8.09

Rite in the Rain

4/16/17

outfall ody monitoring continued

1325 Temp 18.0°C

DO 78.4%

Cond 633 $\mu\text{S}/\text{cm}$

pH 8.04

Outside Temp 15.68°F
Sunny

1335 Temp 18.3°C

DO 76.8%

Cond 736

pH 8.15

1345 Temp 19.5°C

DO 72.3%

Cond 889 $\mu\text{S}/\text{cm}$

pH 8.28

moved probe

farther into outfall

flow

1400 Temp 18.6

DO 75.6%

Cond 827 $\mu\text{S}/\text{cm}$

pH 8.18

4/17/17

62°F, Sunny

0830 START (Knox, Croft, Houle) onsite

EPA already on site

0900 morning meeting

START will be collecting

water + sediment samples

water monitoring w/ YSI (00183)

at outfall

0955 Monitor from platform at
outfallBottom of boom saturated
with oil ~~ok~~

1000 at outfall

Temp 17.9

DO% 74.9

Cond. 782

pH 8.03

1010 at outfall

Temp 18.0

DO% 78.8

Cond. 805

pH 8.10

1020 at outfall

Temp 18.3

DO% 81.5

Cond 851

pH 8.07

Rite in the Rain

4/17/17

Confirm w/ EPA + US Steel
environmental that saturation
on boom is biological, not oil

1030 at outfall

Temp 18.1
DO% 81.4
cond. 834
pH 8.09

1040 at outfall

Temp 18.6
DO% 81.0
cond. 874
pH 8.14

1050 at outfall - YSI died

Temp —
DO% —
cond. —
pH —

1130 at monitor from boat

1130 Point B (500ft. south of outfall)

Temp 17.0
DO% 103.3
cond. 605
pH 8.00

4/17/17

1140 Point C (at outfall)

Temp 17.0
DO% 96.4
Cond. 597
pH 7.94

1145 Point D (opening of bay)

Temp 17.2
DO% ~~75.5~~ 96.5
cond. 622
pH 7.88

1150 Point E (north of point D)

Temp 17.1
DO% 95.0
cond. 609
pH 7.95

1155 Point F (north of point E)

Temp 17.2
DO% 94.2
cond 612
pH 7.95

1200 Point G (northern part of bay)

Temp 17.2
DO% 93.2
cond. 617
pH 7.96

Rite in the Rain

30 4/17/17

1220 monitor from outfall

1225 at outfall

Temp 18.9

DO% 87.7

Conductivity 770

pH 8.14

1235 at outfall

Temp 19.0

DO% 83.3

Cond. 755

pH 8.13

1245 at outfall

Temp 18.5

DO% 82.7

Cond. 720

pH 8.11

1300 monitor from boat

1305 Point B

Temp. 17.1

DO% 94.0

Cond. 595

pH 7.85

1310 Point C

Temp 17.3

DO% 94.7

Cond. 615

pH 8.03

4/17/17

1315 Point D

Temp 17.5

DO% 13.5

Cond. 624

pH 8.00

1320 Point E

Temp 17.5

DO% 93.0

Cond. ~~624~~ 624

pH 8.00

1325 Point F

Temp 17.5

DO% 94.0

Cond. 620

pH 8.03

1330 Point G (northern part of bay by mouth to lake)

Temp 17.6

DO% 94.1

Cond. 618

pH 8.01

1410 monitor from platform

1415 outfall

Temp 18.8

DO% 89.1

Cond. 145

pH 8.17

Rite in the Rain.

4/17/17

1425 at outfall

Temp 18.7

DO% 85.2

Cond. 726

pH 8.15

1435 at outfall

Temp 19.3

DO% 80.7

Cond. 710

pH 8.22

1445 at outfall

Temp 18.7

DO% 81.3

Cond. 638

pH 8.20

1505 monitor from boat

1510 Point B

Temp 17.4

DO% 99.4

Cond. 604

pH 8.13

1515 Point C

Temp 17.4

DO% 96.5

Cond. 615

pH 8.10

4/17/17

1520 ~~at outfall~~ Point D

Temp C 17.7

DO% 98.3

Cond. 625

pH 8.10

1525 Point E

Temp 17.7

DO% 96.2

Cond. 622

pH 8.10

1530 Point F

Temp 17.7

DO% 94.2

Cond 621

pH 8.10

1535 Point G

Temp 17.4

DO% 97.2

Cond 607

pH 8.10

1605 monitor from outfall platform

Temp 18.3

DO% 91.1

Cond. 602

pH 8.35

4/17/17

1620 at outfall

Temp 17.9

DO% 87.7

Cond. 594

pH 8.40

1630 at outfall

Temp 17.8

DO% 86.5

cond. 596

pH 8.40

U.S. Steel environmental says
higher pH may be due to added
limestone. ~~twitter~~

1640 at outfall

Temp 18.2

DO% 84.3

cond. 596

pH 8.46

1650 at outfall

Temp 17.9

DO% 85.5

cond. 599

pH 8.43

1705 monitor from boat

4/17/17

1710 Point B

Temp 17.6

DO% 100.4

cond 621

pH 8.28

1715 Point C

Temp 17.6

DO% ~~100.4~~ 97.6

cond 610

pH 8.33

1720 Point D

Temp 17.7

DO% 99.7

cond 620

pH 8.32

1725 Point E

Temp 17.6

DO% 99.4

cond 618

pH 8.34

1730 Point F

Temp 16.9

DO% 100.0

cond 586

pH 8.36

Rite in the Rain

4/17/17

1735 Point G

Temp 17.4

DO% 102.0

Cond. 603

pH 8.38

1745 Monitoring at outfall platform

Temp 18.5

DO% 90.3

Cond. 578

pH 8.52

1755 at outfall

Temp 18.5

DO% 86.5

Cond. 586

pH 8.57

2

4/18/17

(Hobbs, Swinkcroft) (Mendez, Malone)

0830 START and EPA on-site JS

0900 Meeting with START, EPA, US Steel,
NPS, Ogden, Police JS

0935 Swilit arrives at outfall 004.

CLOF, Mostly Sunny, 10mph wind from SE,

Air quality good 25, 50% Humidity, JS

0945 monitoring at outfall 004

Temp (°C) 19.4

DO (%) 93.2

Cond (µS/cm) 876

pH 8.53

using 00183 NPS YSI meter JS

0955 monitoring at outfall 004 JS

Temp (°C) 19.4

DO (%) 81.8

Cond (µS/cm) 904

pH 8.82

1005 monitoring at outfall 004 JS

Temp (°C) 19.5

DO (%) 79.3

Cond (µS/cm) 893

pH 8.86

1015 monitoring at outfall 004 JS

Temp 19.5°C

Rite in the Rain

4/18/17

DO% 78.3
 Cond - 15^{us}/cm 886
 pH 8.91

1025 monitoring at outfall 004 — JS

Temp (°C) 19.3
 DO (%) 80.4
 Cond (^{us}/cm) 889
 pH 9.02

1035 monitoring at outfall 004 — JS

Temp (°C) 19.8
 DO (%) 77.5
 Cond (^{us}/cm) 898
 pH 9.03

1150 monitoring from boat — JS

1155 Point B

Temp 16.2
 DO 117.5
 Cond 614
 pH 8.23

1200 Point C — JS

Temp 16.1 °C
 DO 114.6 %
 Cond 636 ^{us}/cm
 pH 7.41

1205 Point D — JS

4/18/17

Temp 16.1 °C
 DO 112.4 %
 Cond 60 ^{us}/cm
 pH 6.05

1210 Point E — JS

Temp 16.3 °C
 DO 111.4 %
 Cond 607 ^{us}/cm
 pH 5.83

1215 Point F — JS

Temp 16.3 °C
 DO 110.8 %
 Cond 607 ^{us}/cm
 pH 5.57

1220 Point G — JS

Temp 16.2 °C
 DO 112.5 %
 Cond 607 ^{us}/cm
 pH 5.61

1225 monitoring at outfall 004 from Platform

Temp 17.4 °C
 DO 115.0 %
 Cond 662 ^{us}/cm
 pH 6.44

Rite in the Rain

4/18/17

1235 monitoring at 004 from platform - JS

Temp (°C) 18.2

DO (%) 100.5

Cond (µS/cm) 713

pH 7.43

1245 monitoring at 004 from platform - JS

Temp (°C) 19.0

DO (%) 97.9

Cond (µS/cm) 743

pH 7.62

1300 monitoring from boat

Point B

Temp (°C) 16.6

DO ~~Cond~~ (µS/cm) (%) 126.5

Cond (µS/cm) 633

pH 8.34

1305 Point C

Temp 16.4 °C

DO 118.2 %

Cond 614 µS/cm

pH 7.86

1310 Point D

Temp 16.3 °C

DO 117.6 %

Cond 617 µS/cm

4/18/17

pH 7.50

1315 Point E

Temp 16.4 °C

DO 117.6 %

Cond 612 µS/cm

pH 7.70

1320 Point F

Temp 16.5 °C

DO 116.6 %

Cond 615 µS/cm

pH 7.77

1325 Point G

Temp 16.4 °C

DO ~~Cond~~ 116.6 %

Cond 616 µS/cm

pH 7.51

1350 monitoring from platform at 004

Temp ~~17.6 °C~~ 18.6 °C

DO 105.8 %

Cond 679 µS/cm

pH 6.42

1400 monitoring from platform at 004

Temp (°C) 18.8

DO (%) 95.7

Rite in the Rain

4/18/17

Cond (A) $\mu\text{S}/\text{cm}$

pH 7.71

1410

monitoring at 004

Temp($^{\circ}\text{C}$) 18.6

DO (%) 96.1

Cond ($\mu\text{S}/\text{cm}$) 681

pH 7.82

1420

monitoring at 004

Temp($^{\circ}\text{C}$) 18.4

DO (%) 96.5

Cond ($\mu\text{S}/\text{cm}$) 693

pH 7.57

1430

monitoring at 004

Temp($^{\circ}\text{C}$) 19.0

DO (%) 93.7

Cond ($\mu\text{S}/\text{cm}$) 686

pH 7.79

1440

monitoring at 004

Temp($^{\circ}\text{C}$) 18.9

DO (%) 92.2

Cond ($\mu\text{S}/\text{cm}$) 686

pH 7.70

1500

monitoring from boat

Point B

Temp($^{\circ}\text{C}$) 16.7

4/18/17

DO (%) 119.0

Cond ($\mu\text{S}/\text{cm}$) 627

pH 8.78

1505 Point C

Temp($^{\circ}\text{C}$) 16.9

DO (%) 112.5

Cond ($\mu\text{S}/\text{cm}$) 625

pH 8.03

1510 Point D

Temp 16.6 $^{\circ}\text{C}$

DO 113.1 %

Cond 613 $\mu\text{S}/\text{cm}$

pH 7.80

1515 Point E

Temp 16.6 $^{\circ}\text{C}$

DO 114.2 %

Cond 615 $\mu\text{S}/\text{cm}$

pH 7.84

1520 Point F

Temp 16.7 $^{\circ}\text{C}$

DO 113.9 %

Cond 584 $\mu\text{S}/\text{cm}$

pH 7.94

4/18/17

1525 Point G

Temp 16.5 °C

DO 113.5 %

Cond 609 $\mu\text{S}/\text{cm}$

pH 8.37

1555 Monitoring from platform at 004

Temp (°C) 19.3

DO (%) 97.0

Cond ($\mu\text{S}/\text{cm}$) 654

pH 9.51

1505 Monitoring from platform at 004

Temp (°C) 19.0

DO (%) 91.5

Cond $\mu\text{S}/\text{cm}$ 634

pH 8.85

1511 Oil Sheen seen for 3rd time about
5m² in

1515 Monitoring from platform at 004

Temp (°C) 18.7

DO (%) 92.6

Cond ($\mu\text{S}/\text{cm}$) 623

pH 8.62

1525 monitoring from platform at 004

Temp 19.3 (°C)

DO 91.7 (%)

4/18/17

Cond 625 ($\mu\text{S}/\text{cm}$)

pH 8.10

1535 Monitoring from platform at 004

Temp (°C) 19.1

DO (%) 91.1

Cond ($\mu\text{S}/\text{cm}$) 631

pH 7.56

1545 Monitoring from 004

Temp (°C) 19.7

DO (%) 87.5

Cond ($\mu\text{S}/\text{cm}$) 655

pH 7.79

1600 monitoring from boat

Point B

Temp 16.9

DO 112.9

Cond 630

pH 9.62

1605 Point C

Temp 16.9

DO 113.3

Cond 633

pH 8.52

Rite in the Rain

4/18/17

1610 Point D

Temp 17.2

DO 109.0

Cond 629

pH 8.40

1615 Point E

Temp 17.0

DO ~~115.5~~ 111.5

Cond 623

pH 8.00

1620 Point F

Temp 16.8

DO 110.6

Cond 616

pH 8.26

1625 Point G

Temp 16.8

DO 111.1

Cond 623

pH 8.12



APPENDIX D
PHOTOGRAPHIC LOG



Photographic Documentation

Client: U.S. EPA Region 5

Site Name: U.S. Steel Hexavalent Chromium Release

Location: Portage, IN

Prepared by: Tetra Tech, Inc.

TDD Number: S05-0001-1704-201

Dates: April 11 – 18, 2017

Photograph No. 1

Date: 4/11/2017

Description: View of hexavalent chromium release from Outfall 004 at 14:30 when START arrived on site on day of release.



Photograph No. 2

Date: 4/11/2017

Description: (East) View of Outfall 004 from the canal at 16:30 on day of release.





Photographic Documentation

Client: U.S. EPA Region 5

Site Name: U.S. Steel Hexavalent Chromium Release

Location: Portage, IN

Prepared by: Tetra Tech, Inc.

TDD Number: S05-0001-1704-201

Dates: April 11 – 18, 2017

Photograph No. 3

Date: 4/13/2017

Description: (Southeast).
START and ALS Laboratories
collecting water samples near
Outfall 004.



Photograph No. 4

Date: 4/13/2017

Description: (West). View of
boat used for water
sampling.





Photographic Documentation

Client: U.S. EPA Region 5

Site Name: U.S. Steel Hexavalent Chromium Release

Location: Portage, IN

Prepared by: Tetra Tech, Inc.

TDD Number: S05-0001-1704-201

Dates: April 11 – 18, 2017

Photograph No. 5

Date: 4/16/2017

Description: (Southeast)
START monitoring water
quality outside Outfall 004.



Photograph No. 6

Date: 4/14/2016

Description: (Southwest)
View of EPA and START
monitoring water quality
from Outfall 004.





Photographic Documentation

Client: U.S. EPA Region 5

Site Name: U.S. Steel Hexavalent Chromium Release

Location: Portage, IN

Prepared by: Tetra Tech, Inc.

TDD Number: S05-0001-1704-201

Dates: April 11 – 18, 2017

Photograph No. 7

Date: 4/12/2017

Description: (Southeast)
START collecting shoreline
sediment samples at West
Beach.



Photograph No. 8

Date: 4/12/2017

Description: Homogenized
sediment sample collected
from a National Parks
lakefront.





Photographic Documentation

Client: U.S. EPA Region 5

Site Name: U.S. Steel Hexavalent Chromium Release

Location: Portage, IN

Prepared by: Tetra Tech, Inc.

TDD Number: S05-0001-1704-201

Dates: April 11 – 18, 2017

Photograph No. 9

Date: 4/12/2017

Description: (North) START preserving beach surface water samples collected at West Beach.



APPENDIX E
ENVIRONMENTALLY PREFERRED PRACTICES

START implemented environmentally preferred practices to maximize sustainability; reduce energy, water use, and toxic air emissions; promote carbon neutrality; and encourage industrial material reuse and recycling. In accordance with contract requirements, U.S. Environmental Protection Agency (EPA) policies, and relevant guidance, START documented project-specific environmentally preferred practices and available metrics in the Environmental Field Practices Checklist, Environmental Office Practices Checklist, and Green Metrics Table (ASTM International 2016; EPA 2012a, 2012b, and 2016).

References:

- ASTM International (ASTM). 2016. "Standard Guide for Greener Cleanups." E2893-16. April 1.
- EPA. 2012a. "Methodology for Understanding and Reducing a Project's Environmental Footprint." Office of Solid Waste and Emergency Response, Office of Superfund Remediation and Technology Innovation. EPA 542-R-12-002. February.
- EPA. 2012b. "U.S. EPA Region 5 Superfund Greener Cleanup Implementation Strategy." March 16.
- EPA. 2016. Memorandum Regarding Consideration of Greener Cleanup Activities in the Superfund Cleanup Process. From Woolford, James, Director, *et. al.* To Regional Superfund National Program Managers and Regional Counsels, Regions 1 – 10. August 2.

TDD #:	S05-0001-1704-201
Site Name:	U.S. Steel Hexavalent Chromium Spill ER
Site City, State:	Portage, Indiana
Site Project Manager:	Justin Button-Hutchens
EPA OSC:	Andrew Maguire

Environmentally Preferred General Field Practices				
If a general category is not applicable, then check N/A for the category box, not for each subcategory.	N = Not Used	N/A = Not Applicable	Y = Yes Implemented	Comments Section Justify in the comments for each BMP field as to why the practice was not used, not applicable, or implemented.
Energy				
Use of Energy Efficient Equipment				
Computer Equipment (FEMP/Energy Star)			X	
Installation of Electric Service		X		
Reduce Carbon Emissions from Transportation				
Use Internet Based Meetings/Conferences		X		On-site everyday
Maximize Carpooling			X	
Use of Local Labor/Suppliers/Waste Disposal Facilities (50 mile radius)			X	4 START personnel from the Chicago Office responded
No idling, except for extreme weather conditions			X	
Use of Alternative Fuels, if available within 10 miles		X		Did not have alternative fuel equipment or vehicles
Properly Inflated Tires			X	Rental car company
Email Small Files (less than 8MB)			X	
Reusable Electronic Storage Media or the Cloud			X	Digital cameras were used
Water				
Use of Low Flow Sampling Pumps			X	
Waste				
Use of Local Recycling Programs	X			Unable to recycle waste due to potential contamination
Use of Rechargeable Batteries			X	
Recycling – Other	X			Unable to recycle waste due to potential contamination
Plastic Reduction	X			Unable to reduce plastic use due to cross contamination
Reuse of Resources	X			Unable to reuse disposable resources due to cross contamination
Direct Push Boring		X		
Materials				
Printing when Required				
Double-sided Printing			X	

Environmentally Preferred General Field Practices				
If a general category is not applicable, then check N/A for the category box, not for each subcategory.	N= Not Used	N/A= Not Applicable	Y = Yes Implemented	Comments Section Justify in the comments for each BMP field as to why the practice was not used, not applicable, or implemented.
100% post-consumer recycled paper	X			
Land & Ecosystems				
Minimize Disruption to Natural Vegetation			X	
Use of Non-invasive Investigation Techniques		X		
Environmentally Preferred				
Green Procurement				
Environmentally Preferred Vendors	X			
Green Lodging/Hotels		X		
Use of Green Laboratories				

TDD #:	S05-0001-1704-201
Site Name:	US Steel Hexavalent Chromium Spill ER
Site City, State:	Portage, IN
Site Project Manager:	Justin Button-Hutchens
EPA OSC:	Andrew Maguire

Green Metrics		
Metric	Amount	Unit of Measure
Diesel Fuel Used	-	gallons
Distance Traveled ¹	2,784.00	Miles
Unleaded Fuel Used ²	105.86	gallons
Alternative/E-85 Fuel Used	-	gallons
Electricity from Coal	-	kW
Electricity from Natural Gas	-	kW
Electricity from solar/wind	-	kW
Electricity from grid/mix	-	kW
Solid waste reused	-	lbs
Solid waste recycled	-	lbs
Water Used	-	gallons

Greenhouse Gas Emissions (Site Specific)					
Source	Amount Used	Unit of Measure	Methane (CH ₄) (Grams) ³	Nitrous Oxide (N ₂ O) (Grams) ³	Carbon Dioxide (CO ₂) (Kilograms) ³
Gasoline	105.86	X gallons	18.37	45.38	943.17
Diesel		X gallons			
E-85		X gallons			
Electricity Office		X Kilowatts			
Natural Gas		X Therms			
Solid Waste		X lbs			
Other		X Unit of Measure			

Note:

¹ Distance traveled based on number of trips between the US Steel Hexavalent Chromium Spill site in Portage, IN, and Tetra Tech's Chicago Office (87 miles) in a large sport utility vehicle, which was required for cargo space. A total of 8 trips were made by 5 Tetra Tech personnel totaling 2,784 miles.

² Fuel consumption based on distance traveled in a large sport utility vehicle. An average fuel efficiency of 26.3 miles per gallon was assumed based on 2014 light duty truck fuel efficiency from "Average Fuel Efficiency of U.S. Light Duty Vehicles," U.S. Department of Transportation, Bureau of Statistics Table 4-23 (Accessed online at http://www.rita.dot.gov/bts/sites/rita.dot.gov/bts/files/publications/national_transportation_statistics/html/table_04_23.html on December 9, 2016).

³ Methane and nitrous oxide emissions based on emission factors of 0.0066 and 0.0163 grams per mile for EPA Tier 2 light duty gasoline trucks from "Voluntary Reporting of Greenhouse Gases Program, Fuel Emission Coefficients, Table 5" (Accessed online at <http://205.254.135.7/oiaf/1605/coefficients.html> on December 9, 2016)

⁴ Carbon dioxide emissions based on emission factors of 8.91 kilograms carbon dioxide per gallon of gasoline and 10.15 kilograms carbon dioxide per gallon of diesel fuel from "Voluntary Reporting of Greenhouse Gases Program, Fuel Emission Coefficients, Table 2" (Accessed online at <http://205.254.135.7/oiaf/1605/coefficients.html> on November 14, 2016).

APPENDIX F
POLREPS

ATTACHMENT 1
DATA VALIDATION REPORTS



May 2, 2017

Andrew Maguire
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604-3507

Subject: Data Validation Reports
U.S. Steel Hexavalent Chrome Release
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1704-201
Document Tracking No. 1688

Dear Mr. Maguire:

Tetra Tech, Inc. (Tetra Tech) is submitting these Data Validation Reports for 393 surface water samples, 56 surface soil samples, and 44 field duplicate samples (30 surface waters and 8 surface soils) collected at the U.S. Steel Hexavalent Chrome Release site. The samples were collected from April 14 through 18, 2017, and were analyzed for total chromium and hexavalent chromium by Pace Analytical Laboratories. The last laboratory data package was received on April 24, 2017.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review* (January 2017).

No results were rejected, but results in some data packages were qualified. The attachment provides the specific details.

If you have any questions regarding these data validation reports, please call me at (312) 201-7756.

Sincerely,

A handwritten signature in black ink that reads 'Gary N. Ellis III'.

START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Justin Button-Hutchens, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORTS
FOR PACE ANALYTICAL DATA PACKAGES**

DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Site Name	U.S. Steel Hexavalent Chrome Release	TDD No.	S05-0001-1704-201
Document Tracking No.	1688A	Technical Reviewer (signature and date)	<i>Jessica A. Vickers</i> May 1, 2017
Data Reviewer (signature and date)	<i>Harry N. Ellis III</i> 24 April 2017	Laboratory	Pace Analytical/Grand Rapids, Michigan
Laboratory Report No.	1704253		
Analyses	Hexavalent chromium by SW-846 Method 7196A		
Samples and Matrix	79 Surface water samples plus 8 field duplicates		
Field Duplicate Pairs	USS-SW-004B-041417/USS-SW-004B-041417-D, USS-SW-010-A-041417/USS-SW-010-A-041417-D, USS-SW-A001-A-041417/USS-SW-A001-A-041417-D, USS-SW-C002-B-041417/USS-SW-C002-B-041417-D, USS-SW-E001-A-041417/USS-SW-E001-A-041417-D, USS-SW-F001-B-041417/USS-SW-F001-B-041417-D, USS-SW-H002-A-041417/USS-SW-H002-A-041417-D, and USS-SW-WB02-041417/USS-SW-WB02-041417-D		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review* (January 2017).

OVERALL EVALUATION

No results were rejected, but all were qualified due to inadequate sample preservation.

Data completeness:

Within Criteria	Exceedance/Notes
Y	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
N	Both coolers were received at the laboratory at temperatures above the standard 4 ± 2 °C; one of them at ambient temperature. Therefore, all results were qualified as estimated, possibly biased low (flagged “UJ” or “J-” as appropriate). Six samples were re-analyzed after expiration of the 24-hour holding time, but less than 48 hours after collection. The results of the original analyses were reported; therefore, no further qualifications were applied.

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
NA	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Method blanks:

Within Criteria	Exceedance/Notes
N	Several continuing calibration blanks contained hexavalent chromium at concentrations below the reporting limits (RLs); however, no qualifications were applied because the associated results were greater than ten times the equivalent blank value or non-detect.

Field blanks:

Within Criteria	Exceedance/Notes
NA	

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
NA	

MS/MSD:

Within Criteria	Exceedance/Notes
N	MS/MSD analyses performed on samples USS-SW-D002-A-041417 and USS-SW-C002-B-041417-D yielded recoveries below the QC limits. No further qualifications were applied.



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSS/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
N	As discussed under the “holding times” section, six samples were re-analyzed, but the original results were reported. In all cases, hexavalent chromium was detected in the original analyses, but not in the re-analyses. The detected results may be due to suspended material, since the samples were described as “cloudy”. If so, they are false positives. No qualifications were applied.

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
NA	

Target analyte identification:

Within Criteria	Exceedance/Notes
NA	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	Some detected results were below the reporting limit and were correctly qualified by the laboratory as estimated (flagged “J”). These flags were superseded by those for sample preservation.



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



U.S. Steel Hexavalent Chrome Site Surface Water Results
Pace Analytical Report No. 1704253

Sample ID	Lab ID	Analyte	Lab Result	Lab Qualifier	DL	RL	Units	Val. Results	Val. Qualifiers
USS-SW-002A-041417	1704257-11	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-002B-041417	1704257-12	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-003A-041417	1704257-13	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-003B-041417	1704257-14	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-004A-041417	1704257-15	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-004B-041417	1704257-16	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-004B-041417-D	1704260-07	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-005A-041417	1704257-17	Chromium, Hexavalent	0.4	J	0.3	1.0	ug/L	0.4	J-
USS-SW-005B-041417	1704257-18	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-006A-041417	1704257-19	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-006B-041417	1704257-20	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-007-A-041417	1704259-01	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-007-B-041417	1704259-02	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-008-A-041417	1704259-03	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-008-B-041417	1704259-04	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-009-A-041417	1704259-05	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-009-B-041417	1704259-06	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-010-A-041417	1704259-07	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-010-A-041417-D	1704260-06	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-010-B-041417	1704259-08	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-011-A-041417	1704259-09	Chromium, Hexavalent	0.6	J	0.3	1.0	ug/L	0.6	J-
USS-SW-011-B-041417	1704259-10	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-012-A-041417	1704259-11	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-012-B-041417	1704259-12	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-A001-A-041417	1704253-01	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-A001-A-041417-D	1704260-01	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-A001-B-041417	1704253-02	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-A002-A-041417	1704253-03	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-A002-B-041417	1704253-04	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-A003-A-041417	1704253-05	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-A003-B-041417	1704253-06	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-B001-A-041417	1704253-07	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-B001-B-041417	1704253-08	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ

U.S. Steel Hexavalent Chrome Site Surface Water Results
Pace Analytical Report No. 1704253

Sample ID	Lab ID	Analyte	Lab Result	Lab Qualifier	DL	RL	Units	Val. Results	Val. Qualifiers
USS-SW-B002-A-041417	1704253-09	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-B002-B-041417	1704253-10	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-B003-A-041417	1704253-11	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-B003-B-041417	1704253-12	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-BB02-041417	1704259-16	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-C001-A-041417	1704253-13	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-C001-B-041417	1704253-14	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-C002-A-041417	1704253-15	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-C002-B-041417	1704253-16	Chromium, Hexavalent	0.4	J	0.3	1.0	ug/L	0.4	J-
USS-SW-C002-B-041417-D	1704260-02	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-C003-A-041417	1704253-17	Chromium, Hexavalent	2.6		0.3	1.0	ug/L	2.6	J-
USS-SW-C003-B-041417	1704253-18	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-D001-A-041417	1704253-19	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-D001-B-041417	1704253-20	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-D002-A-041417	1704256-01	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-D002-B-041417	1704256-02	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-D003-A-041417	1704256-03	Chromium, Hexavalent	15.5		0.3	1.0	ug/L	15.5	J-
USS-SW-D003-B-041417	1704256-04	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-DB02-041417	1704259-13	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-E001-A-041417	1704256-05	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-E001-A-041417-D	1704260-03	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-E001-B-041417	1704256-06	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-E002-A-041417	1704256-07	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-E002-B-041417	1704256-08	Chromium, Hexavalent	21.5		0.3	1.0	ug/L	21.5	J-
USS-SW-E003-A-041417	1704256-09	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-E003-B-041417	1704256-10	Chromium, Hexavalent	1.4		0.3	1.0	ug/L	1.4	J-
USS-SW-F001-A-041417	1704256-11	Chromium, Hexavalent	0.4	J	0.3	1.0	ug/L	0.4	J-
USS-SW-F001-B-041417	1704256-12	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-F001-B-041417-D	1704260-04	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-F002-A-041417	1704256-13	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-F002-B-041417	1704256-14	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-F003-A-041417	1704256-15	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-F003-B-041417	1704256-16	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ

U.S. Steel Hexavalent Chrome Site Surface Water Results
Pace Analytical Report No. 1704253

Sample ID	Lab ID	Analyte	Lab Result	Lab Qualifier	DL	RL	Units	Val. Results	Val. Qualifiers
USS-SW-G001-A-041417	1704256-17	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-G001-B-041417	1704256-18	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-G002-A-041417	1704256-19	Chromium, Hexavalent	1.2		0.3	1.0	ug/L	1.2	J-
USS-SW-G002-B-041417	1704256-20	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-G003-A-041417	1704257-01	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-G003-B-041417	1704257-02	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-H001-A-041417	1704257-03	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-H001-B-041417	1704257-04	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-H002-A-041417	1704257-05	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-H002-A-041417-D	1704260-05	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-H002-B-041417	1704257-06	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-H003-A-041417	1704257-07	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-H003-B-041417	1704257-08	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-Intake-A-041417	1704257-09	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-Intake-B-041417	1704257-10	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-KB02-041417	1704259-14	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-OD02-041417	1704259-18	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-PB02-041417	1704259-15	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-PL02-041417	1704259-19	Chromium, Hexavalent	5.9		0.3	1.0	ug/L	5.9	J-
USS-SW-WB02-041417	1704259-17	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-WB02-041417-D	1704259-20	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ

DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Site Name	U.S. Steel Hexavalent Chrome Release	TDD No.	S05-0001-1704-201
Document Tracking No.	1688B	Technical Reviewer (signature and date)	<i>Jessica A. Vickers</i> May 1, 2017
Data Reviewer (signature and date)	<i>Harry N. Ellis III</i> 24 April 2017	Laboratory	Pace Analytical/Grand Rapids, Michigan
Laboratory Report No.	1704261		
Analyses	Hexavalent chromium by SW-846 Method 7196A		
Samples and Matrix	79 Surface water samples and 8 field duplicates		
Field Duplicate Pairs	USS-SW-004A-041517/USS-SW-004A-041517-D, USS-SW-008B-041517/USS-SW-008B-041517-D, USS-SW-012A-041517/USS-SW-012A-041517-D, USS-SW-B002-A-041517/USS-SW-B002-A-041517-D, USS-SW-C001-B-041517/USS-SW-C001-B-041517-D, USS-SW-D002-A-041517/USS-SW-D002-A-041517-D, USS-SW-DB02-041517/USS-SW-DB02-041517-D, and USS-SW-E002-A-041517/USS-SW-E002-A-041517-D		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review* (January 2017).

OVERALL EVALUATION

Results were neither rejected nor qualified. All may be used as reported.

Data completeness:

Within Criteria	Exceedance/Notes
Y	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
NA	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Method blanks:

Within Criteria	Exceedance/Notes
N	Several continuing calibration blanks contained hexavalent chromium at concentrations below the reporting limits (RLs); however, no qualifications were applied because the associated results were greater than ten times the equivalent blank value or non-detect.

Field blanks:

Within Criteria	Exceedance/Notes
NA	

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
NA	

MS/MSD:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	

Field duplicates:

Within Criteria	Exceedance/Notes
Y	Hexavalent chromium was not detected in any of the field duplicate samples.

LCSS/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
NA	

Target analyte identification:

Within Criteria	Exceedance/Notes
NA	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	All detected results were less than their sample reporting limits and were correctly qualified by the laboratory as estimated (flagged "J").

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



U.S. Steel Hexavalent Chrome Release Surface Water Results
Pace Analytical Report No. 1704261

Sample ID	Lab ID	Analyte	Lab Result	Lab Qualifier	DL	RL	Units	Val. Results	Val. Qualifiers
USS-SW-002-A-041517	1704276-09	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-002-B-041517	1704276-10	Chromium, Hexavalent	0.3	J	0.3	1.0	ug/L	0.3	J
USS-SW-003-A-041517	1704276-11	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-003-B-041517	1704276-12	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-004-A-041517	1704276-13	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-004A-041517-D	1704278-03	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-004-B-041517	1704276-14	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-005-A-041517	1704276-15	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-005-B-041517	1704276-16	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-006-A-041517	1704276-17	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-006-B-041517	1704276-18	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-007-A-041517	1704276-19	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-007-B-041517	1704276-20	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-008-A-041517	1704277-01	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-008-B-041517	1704277-02	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-008B-041517-D	1704278-04	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-009-A-041517	1704277-03	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-009-B-041517	1704277-04	Chromium, Hexavalent	0.3	J	0.3	1.0	ug/L	0.3	J
USS-SW-010-A-041517	1704277-05	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-010-B-041517	1704277-06	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-011-A-041517	1704277-07	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-011-B-041517	1704277-08	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-012-A-041517	1704277-09	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-012A-041517-D	1704278-02	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-012-B-041517	1704277-10	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-A001-A-041517	1704261-01	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-A001-B-041517	1704261-02	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-A002-A-041517	1704261-03	Chromium, Hexavalent	0.5	J	0.3	1.0	ug/L	0.5	J
USS-SW-A002-B-041517	1704261-04	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-A003-A-041517	1704261-05	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-A003-B-041517	1704261-06	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-B001-A-041517	1704261-07	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-B001-B-041517	1704261-08	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U


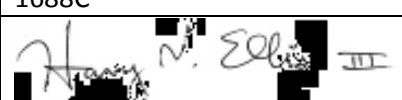
U.S. Steel Hexavalent Chrome Release Surface Water Results
Pace Analytical Report No. 1704261

Sample ID	Lab ID	Analyte	Lab Result	Lab Qualifier	DL	RL	Units	Val. Results	Val. Qualifiers
USS-SW-B002-A-041517	1704261-09	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-B002-A-041517-D	1704278-06	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-B002-B-041517	1704261-10	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-B003-A-041517	1704261-11	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-B003-B-041517	1704261-12	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-BB02-041517	1704277-14	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-C001-A-041517	1704261-13	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-C001-B-041517	1704261-14	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-C001-B-041517-D	1704278-08	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-C002-A-041517	1704261-15	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-C002-B-041517	1704261-16	Chromium, Hexavalent	0.3	J	0.3	1.0	ug/L	0.3	J
USS-SW-C003-A-041517	1704261-17	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-C003-B-041517	1704261-18	Chromium, Hexavalent	0.5	J	0.3	1.0	ug/L	0.5	J
USS-SW-D001-A-041517	1704261-19	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-D001-B-041517	1704261-20	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-D002-A-041517	1704261-21	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-D002-A-041517-D	1704278-07	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-D002-B-041517	1704262-01	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-D003-A-041517	1704262-02	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-D003-B-041517	1704262-03	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-DB02-041517	1704277-11	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-DB02-041517-D	1704278-01	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-E001-A-041517	1704262-04	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-E001-B-041517	1704262-05	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-E002-A-041517	1704262-06	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-E002-A-041517-D	1704278-05	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-E002-B-041517	1704262-07	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-E003-A-041517	1704262-08	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-E003-B-041517	1704262-09	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-F001-A-041517	1704262-10	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-F001-B-041517	1704262-11	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-F002-A-041517	1704262-12	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-F002-B-041517	1704262-13	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U

U.S. Steel Hexavalent Chrome Release Surface Water Results
Pace Analytical Report No. 1704261

Sample ID	Lab ID	Analyte	Lab Result	Lab Qualifier	DL	RL	Units	Val. Results	Val. Qualifiers
USS-SW-F003-A-041517	1704262-14	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-F003-B-041517	1704262-15	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-G001-A-041517	1704262-16	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-G001-B-041517	1704262-17	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-G002-A-041517	1704262-18	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-G002-B-041517	1704262-19	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-G003-A-041517	1704262-20	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-G003-B-041517	1704262-21	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-H001-A-041517	1704276-01	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-H001-B-041517	1704276-02	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-H002-A-041517	1704276-03	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-H002-B-041517	1704276-04	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-H003-A-041517	1704276-05	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-H003-B-041517	1704276-06	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-Intake-A-041517	1704276-07	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-Intake-B-041517	1704276-08	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-KB02-041517	1704277-12	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-OD02-041517	1704277-16	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-PB02-041517	1704277-13	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-PL02-041517	1704277-17	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-WB02-041517	1704277-15	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U

DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Site Name	U.S. Steel Hexavalent Chrome Release	TDD No.	S05-0001-1704-201
Document Tracking No.	1688C	Technical Reviewer (signature and date)	 May 1, 2017
Data Reviewer (signature and date)	 25 April 2017	Laboratory	Pace Analytical/Grand Rapids, Michigan
Laboratory Report No.	1704279		
Analyses	Hexavalent chromium by SW-846 Method 7196A		
Samples and Matrix	79 Surface water samples and 5 field duplicate samples		
Field Duplicate Pairs	USS-SW-002-A-041617/USS-SW-002-A-041617-D, USS-SW-005B-041617/USS-SW-005B-041617-D, USS-SW-B002-B-041617/USS-SW-B002-B-041617-D, USS-SW-D002-A-041617/USS-SW-D002-A-041617-D, and USS-SW-PB02-041617/USS-SW-PB02-041617-D		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review* (January 2017).

OVERALL EVALUATION

No result were rejected, but a few were qualified. All may be used as qualified.

Data completeness:

Within Criteria	Exceedance/Notes
Y	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
NA	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Method blanks:

Within Criteria	Exceedance/Notes
N	Several continuing calibration blanks contained hexavalent chromium at concentrations below the reporting limits (RLs); however, no qualifications were applied because the associated results were non-detect.

Field blanks:

Within Criteria	Exceedance/Notes
NA	

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
NA	

MS/MSD:

Within Criteria	Exceedance/Notes
N	The analyses on sample USS-SW-003-B-041617 yielded recoveries of 106 and 71 percent, versus QAPP limits of 75 to 125 percent. The average recovery was within limits; therefore, no qualifications were applied. The analyses performed on sample USS-SW-010-B-041617 yielded recoveries of 64 and 61 percent, and those on sample USS-SW-011-A-041617 yielded recoveries of 68 and 25 percent. Therefore, the non-detect results for these two parent samples were qualified as estimated, possibly biased low (flagged "UJ"). The analyses on samples USS-SW-003-B-041617 and USS-SW-011-A-01617 yielded excessive relative percent differences. The unspiked results from those two samples were nondetected, so no further qualifications were applied.



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	

Field duplicates:

Within Criteria	Exceedance/Notes
Y	Hexavalent chromium was not detected in any of the field duplicate samples.

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
NA	

Target analyte identification:

Within Criteria	Exceedance/Notes
NA	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	All results were non-detect.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



U.S. Steel Hexavalent Chrome Release Surface Water Results
Pace Analytical Report No. 1704279

Sample ID	Lab ID	Analyte	Lab Result	Lab Qualifier	DL	RL	Units	Val. Results	Val. Qualifiers
USS-SW-002-A-041617	1704281-09	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-002-A-041617-D	1704282-22	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-002-B-041617	1704281-10	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-003-A-041617	1704281-11	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-003-B-041617	1704281-12	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-004-A-041617	1704281-13	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-004-B-041617	1704281-14	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-005-A-041617	1704281-15	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-005-B-041617	1704281-16	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-005B-041617-D	1704282-18	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-006-A-041617	1704281-17	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-006-B-041617	1704281-18	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-007-A-041617	1704281-19	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-007-B-041617	1704281-20	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-008-A-041617	1704282-01	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-008-B-041617	1704282-02	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-009-A-041617	1704282-03	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-009-B-041617	1704282-04	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-010-A-041617	1704282-05	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-010-B-041617	1704282-06	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-011-A-041617	1704282-07	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	UJ
USS-SW-011-B-041617	1704282-08	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-012-A-041617	1704282-09	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-012-B-041617	1704282-10	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-A001-A-041617	1704279-01	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-A001-B-041617	1704279-02	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-A002-A-041617	1704279-03	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-A002-B-041617	1704279-04	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-A003-A-041617	1704279-05	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-A003-B-041617	1704279-06	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-B001-A-041617	1704279-07	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-B001-B-041617	1704279-08	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-B002-A-041617	1704279-09	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U

U.S. Steel Hexavalent Chrome Release Surface Water Results
Pace Analytical Report No. 1704279

Sample ID	Lab ID	Analyte	Lab Result	Lab Qualifier	DL	RL	Units	Val. Results	Val. Qualifiers
USS-SW-B002-B-041617	1704279-10	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-B002-B-041617-D	1704282-20	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-B003-A-041617	1704279-11	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-B003-B-041617	1704279-12	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-BB02-041617	1704282-14	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-C001-A-041617	1704279-13	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-C001-B-041617	1704279-14	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-C002-A-041617	1704279-15	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-C002-B-041617	1704279-16	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-C003-A-041617	1704279-17	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-C003-B-041617	1704279-18	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-D001-A-041617	1704279-19	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-D001-B-041617	1704279-20	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-D002-A-041617	1704279-21	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-D002-A-041617-D	1704282-21	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-D002-B-041617	1704280-01	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-D003-A-041617	1704280-02	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-D003-B-041617	1704280-03	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-DB02-041617	1704282-11	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-E001-A-041617	1704280-04	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-E001-B-041617	1704280-05	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-E002-A-041617	1704280-06	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-E002-B-041617	1704280-07	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-E003-A-041617	1704280-08	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-E003-B-041617	1704280-09	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-F001-A-041617	1704280-10	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-F001-B-041617	1704280-11	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-F002-A-041617	1704280-12	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-F002-B-041617	1704280-13	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-F003-A-041617	1704280-14	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-F003-B-041617	1704280-15	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-G001-A-041617	1704280-16	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-G001-B-041617	1704280-17	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U

U.S. Steel Hexavalent Chrome Release Surface Water Results
Pace Analytical Report No. 1704279

Sample ID	Lab ID	Analyte	Lab Result	Lab Qualifier	DL	RL	Units	Val. Results	Val. Qualifiers
USS-SW-G002-A-041617	1704280-18	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-G002-B-041617	1704280-19	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-G003-A-041617	1704280-20	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-G003-B-041617	1704280-21	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-H001-A-041617	1704281-01	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-H001-B-041617	1704281-02	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-H002-A-041617	1704281-03	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-H002-B-041617	1704281-04	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-H003-A-041617	1704281-05	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-H003-B-041617	1704281-06	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-Intake-A-041617	1704281-07	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-Intake-B-041617	1704281-08	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-KB02-041617	1704282-12	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-OD02-041617	1704282-16	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-PB02-041617	1704282-13	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-PB02-041617-D	1704282-19	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-PL02-041617	1704282-17	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-WB02-041617	1704282-15	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U

DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Site Name	U.S. Steel Hexavalent Chrome Release	TDD No.	S05-0001-1704-201
Document Tracking No.	1688D	Technical Reviewer (signature and date)	<i>Jessica A. Vickers</i> May 1, 2017
Data Reviewer (signature and date)	<i>Harry N. Ellis III</i> 25 April 2017	Laboratory	Pace Analytical/Grand Rapids, Michigan
Laboratory Report No.	1704295		
Analyses	Hexavalent chromium by SW-846 Method 7196A		
Samples and Matrix	79 Surface water samples and 4 field duplicates		
Field Duplicate Pairs	USS-SW-003A-041717/USS-SW-003A-041717-D, USS-SW-H002-A-041717/USS-SW-H002-A-041717-D, USS-SW-Intake-A-041717/USS-SW-Intake-A-041717-D, and USS-SW-WB02-041717/USS-SW-WB02-041717-D		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review* (January 2017).

OVERALL EVALUATION

No data were rejected or qualified. All may be used as reported.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
NA	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
N	Several continuing calibration blanks contained hexavalent chromium at concentrations below the reporting limits (RLs); however, no qualifications were applied because the associated results were non-detect.

Field blanks:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
NA	

MS/MSD:

Within Criteria	Exceedance/Notes
Y	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Field duplicates:

Within Criteria	Exceedance/Notes
Y	Hexavalent chromium was not detected in any of the field duplicate samples.

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4

EPA REGION 5 START CONTRACT

Target analyte identification:

Within Criteria	Exceedance/Notes
NA	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The one detected result was less than the sample reporting limit and was correctly qualified by the laboratory as estimated (flagged “J”).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
NA	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



U.S. Steel Hexavalent Chrome Release Surface Water Results
Pace Analytical Report No. 1704295

Sample ID	Lab ID	Analyte	Lab Result	Lab Qualifier	DL	RL	Units	Val. Results	Val. Qualifiers
USS-SW-002A-041717	1704297-09	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-002B-041717	1704297-10	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-003A-041717	1704297-11	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-003A-041717-D	1704298-19	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-003B-041717	1704297-12	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-004A-041717	1704297-13	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-004B-041717	1704297-14	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-005A-041717	1704297-15	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-005B-041717	1704297-16	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-006A-041717	1704297-17	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-006B-041717	1704297-18	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-007-A-041717	1704297-19	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-007-B-041717	1704297-20	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-008-A-041717	1704298-01	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-008-B-041717	1704298-02	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-009-A-041717	1704298-03	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-009-B-041717	1704298-04	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-010-A-041717	1704298-05	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-010-B-041717	1704298-06	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-011-A-041717	1704298-07	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-011-B-041717	1704298-08	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-012-A-041717	1704298-09	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-012-B-041717	1704298-10	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-A001-A-041717	1704295-01	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-A001-B-041717	1704295-02	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-A002-A-041717	1704295-03	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-A002-B-041717	1704295-04	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-A003-A-041717	1704295-05	Chromium, Hexavalent	0.4	J	0.3	1.0	ug/L	0.4	J
USS-SW-A003-B-041717	1704295-06	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-B001-A-041717	1704295-07	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-B001-B-041717	1704295-08	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-B002-A-041717	1704295-09	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-B002-B-041717	1704295-10	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U

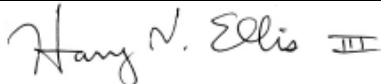

U.S. Steel Hexavalent Chrome Release Surface Water Results
Pace Analytical Report No. 1704295

Sample ID	Lab ID	Analyte	Lab Result	Lab Qualifier	DL	RL	Units	Val. Results	Val. Qualifiers
USS-SW-B003-A-041717	1704295-11	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-B003-B-041717	1704295-12	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-BB02-041717	1704298-14	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-C001-A-041717	1704295-13	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-C001-B-041717	1704295-14	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-C002-A-041717	1704295-15	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-C002-B-041717	1704295-16	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-C003-A-041717	1704295-17	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-C003-B-041717	1704295-18	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-D001-A-041717	1704295-19	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-D001-B-041717	1704295-20	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-D002-A-041717	1704295-21	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-D002-B-041717	1704296-01	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-D003-A-041717	1704296-02	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-D003-B-041717	1704296-03	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-DB02-041717	1704298-11	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-E001-A-041717	1704296-04	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-E001-B-041717	1704296-05	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-E002-A-041717	1704296-06	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-E002-B-041717	1704296-07	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-E003-A-041717	1704296-08	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-E003-B-041717	1704296-09	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-F001-A-041717	1704296-10	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-F001-B-041717	1704296-11	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-F002-A-041717	1704296-12	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-F002-B-041717	1704296-13	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-F003-A-041717	1704296-14	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-F003-B-041717	1704296-15	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-G001-A-041717	1704296-16	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-G001-B-041717	1704296-17	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-G002-A-041717	1704296-18	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-G002-B-041717	1704296-19	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-G003-A-041717	1704296-20	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U

U.S. Steel Hexavalent Chrome Release Surface Water Results
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Sample ID	Lab ID	Analyte	Lab Result	Lab Qualifier	DL	RL	Units	Val. Results	Val. Qualifiers
USS-SW-G003-B-041717	1704296-21	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-H001-A-041717	1704297-01	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-H001-B-041717	1704297-02	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-H002-A-041717	1704297-03	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-H002-A-041717-D	1704298-20	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-H002-B-041717	1704297-04	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-H003-A-041717	1704297-05	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-H003-B-041717	1704297-06	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-Intake-A-041717	1704297-07	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-Intake-A-041717-D	1704297-21	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-Intake-B-041717	1704297-08	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-KB02-041717	1704298-12	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-OD02-041717	1704298-16	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-PB02-041717	1704298-13	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-PL02-041717	1704298-17	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-WB02-041717	1704298-15	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-WB02-041717-D	1704298-18	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U

DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Site Name	U.S. Steel Hexavalent Chrome Release	TDD No.	S05-0001-1704-201
Document Tracking No.	1688E		
Data Reviewer (signature and date)	 25 April 2017	Technical Reviewer (signature and date)	 May 1, 2017
Laboratory Report No.	1704318	Laboratory	Pace Analytical/Grand Rapids, Michigan
Analyses	Hexavalent chromium by SW-846 Method 7196A		
Samples and Matrix	77 Surface water samples and 5 field duplicates		
Field Duplicate Pairs	USS-SW-003-A-041817/USS-SW-003-A-041817, USS-SW-PL02-041817/USS-SW-PL02-041817, USS-SW-B002-A-041817/USS-SW-B002-A-041817, USS-SW-C002-A-041817/USS-SW-C002-A-041817, and USS-SW-Intake-A-041817/USS-SW-Intake-A-041817		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review* (January 2017).

OVERALL EVALUATION

No results were rejected or qualified. All may be used as reported.

Data completeness:

Within Criteria	Exceedance/Notes
Y	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
NA	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Method blanks:

Within Criteria	Exceedance/Notes
N	Several continuing calibration blanks and two of the method blanks contained hexavalent chromium at concentrations below the reporting limits (RLs); however, no qualifications were applied because the associated results were greater than ten times the equivalent blank values or non-detect.

Field blanks:

Within Criteria	Exceedance/Notes
NA	

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
NA	

MS/MSD:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	

Field duplicates:

Within Criteria	Exceedance/Notes
Y	Hexavalent chromium was not detected in any of the field duplicate samples.

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
NA	

Target analyte identification:

Within Criteria	Exceedance/Notes
NA	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	All detected results were less than their sample reporting limits and were correctly qualified by the laboratory as estimated (flagged "J").

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



U.S. Steel Hexavalent Chrome Surface Water Results
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Sample ID	Lab ID	Analyte	Lab result	Lab Qualifier	DL	RL	Units	Val. Results	Val. Qualifiers
USS-SW-002A-041817	1704320-09	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-002B-041817	1704320-10	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-003A-041817	1704320-11	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-003A-041817-D	1704320-21	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-003B-041817	1704320-12	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-004A-041817	1704320-13	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-004B-041817	1704320-14	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-005A-041817	1704320-15	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-005B-041817	1704320-16	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-006A-041817	1704320-17	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-006B-041817	1704320-18	Chromium, Hexavalent	0.6	J	0.3	1.0	ug/L	0.6	J
USS-SW-007-A-041817	1704320-19	Chromium, Hexavalent	0.9	J	0.3	1.0	ug/L	0.9	J
USS-SW-007-B-041817	1704320-20	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-008-A-041817	1704321-01	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-008-B-041817	1704321-02	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-009-A-041817	1704321-03	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-009-B-041817	1704321-04	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-010-A-041817	1704321-05	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-010-B-041817	1704321-06	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-011-A-041817	1704321-07	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-011-B-041817	1704321-08	Chromium, Hexavalent	0.6	J	0.3	1.0	ug/L	0.6	J
USS-SW-012-A-041817	1704321-09	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-012-B-041817	1704321-10	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-A001-A-041817	1704318-01	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-A001-B-041817	1704318-02	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-A002-A-041817	1704318-03	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-A002-B-041817	1704318-04	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-A003-A-041817	1704318-05	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-A003-B-041817	1704318-06	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-B001-A-041817	1704318-07	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-B001-B-041817	1704318-08	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-B002-A-041817	1704318-09	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-B002-A-041817-D	1704321-17	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U

U.S. Steel Hexavalent Chrome Surface Water Results
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Sample ID	Lab ID	Analyte	Lab result	Lab Qualifier	DL	RL	Units	Val. Results	Val. Qualifiers
USS-SW-B002-B-041817	1704318-10	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-B003-A-041817	1704318-11	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-B003-B-041817	1704318-12	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-BB02-041817	1704321-12	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-C001-A-041817	1704318-13	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-C001-B-041817	1704318-14	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-C002-A-041817	1704318-15	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-C002-A-041817-D	1704321-18	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-C002-B-041817	1704318-16	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-C003-A-041817	1704318-17	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-C003-B-041817	1704318-18	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-D001-A-041817	1704318-19	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-D001-B-041817	1704318-20	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-D002-A-041817	1704318-21	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-D002-B-041817	1704319-01	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-D003-A-041817	1704319-02	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-D003-B-041817	1704319-03	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-E001-A-041817	1704319-04	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-E001-B-041817	1704319-05	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-E002-A-041817	1704319-06	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-E002-B-041817	1704319-07	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-E003-A-041817	1704319-08	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-E003-B-041817	1704319-09	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-F001-A-041817	1704319-10	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-F001-B-041817	1704319-11	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-F002-A-041817	1704319-12	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-F002-B-041817	1704319-13	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-F003-A-041817	1704319-14	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-F003-B-041817	1704319-15	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-G001-A-041817	1704319-16	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-G001-B-041817	1704319-17	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-G002-A-041817	1704319-18	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-G002-B-041817	1704319-19	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U

U.S. Steel Hexavalent Chrome Surface Water Results
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Sample ID	Lab ID	Analyte	Lab result	Lab Qualifier	DL	RL	Units	Val. Results	Val. Qualifiers
USS-SW-G003-A-041817	1704319-20	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-G003-B-041817	1704319-21	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-H001-A-041817	1704320-01	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-H001-B-041817	1704320-02	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-H002-A-041817	1704320-03	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-H002-B-041817	1704320-04	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-H003-A-041817	1704320-05	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-H003-B-041817	1704320-06	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-Intake-A-041817	1704320-07	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-Intake-A-041817-D	1704321-19	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-Intake-B-041817	1704320-08	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-OD02-041817	1704321-14	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-PB02-041817	1704321-11	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-PL02-041817	1704321-15	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-PL02-041817-D	1704321-16	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U
USS-SW-WB02-041817	1704321-13	Chromium, Hexavalent	1.0	U	0.3	1.0	ug/L	1.0	U

DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Site Name	U.S. Steel Hexavalent Chrome Release	TDD No.	S05-0001-1704-201
Document Tracking No.	1688F	Technical Reviewer (signature and date)	<i>Jessica A. Vickers</i> May 1, 2017
Data Reviewer (signature and date)	<i>Harry N. Ellis III</i> 25 April 2017	Laboratory	Pace Analytical/Indianapolis, Indiana
Laboratory Report No.	50168923		
Analyses	Hexavalent chromium by SW-846 Method 7196A and total chromium by SW-846 Method 6010B		
Samples and Matrix	14 Surface soil samples and 2 field duplicates		
Field Duplicate Pairs	USS-SS-PL01-041417/USS-SS-PL01-041417-D and USS-SS-PL02-041417/USS-SS-PL02-041417-D		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review* (January 2017).

OVERALL EVALUATION

No results were rejected, but a few were qualified. All may be used as qualified.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
NA	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
Y	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
NA	

MS/MSD:

Within Criteria	Exceedance/Notes
Y	

Post digestion spikes:

Within Criteria	Exceedance/Notes
Y	

Serial dilutions:

Within Criteria	Exceedance/Notes
Y	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
Y	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Field duplicates:

Within Criteria	Exceedance/Notes
N	Sample USS-SS-PL02-041417-D yielded about 3 times the total chromium concentration of its primary sample, indicating heterogeneity of distribution of the metal in the soil. Therefore, the field duplicate results for total chromium in that pair were qualified as estimated (flagged “J”).

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Internal Standards:

Within Criteria	Exceedance/Notes
NA	

Target analyte identification:

Within Criteria	Exceedance/Notes
NA	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	All total chromium results were above RLs and all hexavalent chromium results were non-detect.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



U.S. Steel Hexavalent Chrome Soil Results
Pace Analytical Report No. 50168923

Sample ID	Lab ID	Analyte	Lab Result	Lab Qualifier	DL	RL	Units	Val. Results	Val. Qualifiers
USS-SS-BB01-041417	50168923007	Chromium	2.9		0.43	0.87	mg/kg	2.9	
USS-SS-BB01-041417	50168923007	Chromium, Hexavalent		U	0.64	2.0	mg/kg	2.0	U
USS-SS-BB02-041417	50168923008	Chromium	4.2		0.45	0.89	mg/kg	4.2	
USS-SS-BB02-041417	50168923008	Chromium, Hexavalent		U	0.64	2.0	mg/kg	2.0	U
USS-SS-DB01-041417	50168923001	Chromium	4.3		0.42	0.84	mg/kg	4.3	
USS-SS-DB01-041417	50168923001	Chromium, Hexavalent		U	0.66	2.0	mg/kg	2.0	U
USS-SS-DB02-041417	50168923002	Chromium	5.2		0.42	0.84	mg/kg	5.2	
USS-SS-DB02-041417	50168923002	Chromium, Hexavalent		U	0.65	2.0	mg/kg	2.0	U
USS-SS-KB01-041417	50168923003	Chromium	1.5		0.42	0.84	mg/kg	1.5	
USS-SS-KB01-041417	50168923003	Chromium, Hexavalent		U	0.64	2.0	mg/kg	2.0	U
USS-SS-KB02-041417	50168923004	Chromium	4.8		0.43	0.85	mg/kg	4.8	
USS-SS-KB02-041417	50168923004	Chromium, Hexavalent		U	0.66	2.0	mg/kg	2.0	U
USS-SS-OD01-041417	50168923011	Chromium	2.1		0.43	0.86	mg/kg	2.1	
USS-SS-OD01-041417	50168923011	Chromium, Hexavalent		U	0.66	2.0	mg/kg	2.0	U
USS-SS-OD02-041417	50168923012	Chromium	2.8		0.45	0.89	mg/kg	2.8	
USS-SS-OD02-041417	50168923012	Chromium, Hexavalent		U	0.65	2.0	mg/kg	2.0	U
USS-SS-PB01-041417	50168923005	Chromium	6.7		0.42	0.84	mg/kg	6.7	
USS-SS-PB01-041417	50168923005	Chromium, Hexavalent		U	0.66	2.0	mg/kg	2.0	U
USS-SS-PB02-041417	50168923006	Chromium	2.2		0.42	0.85	mg/kg	2.2	
USS-SS-PB02-041417	50168923006	Chromium, Hexavalent		U	0.65	2.0	mg/kg	2.0	U
USS-SS-PL01-041417	50168923013	Chromium	2.2		0.46	0.91	mg/kg	2.2	
USS-SS-PL01-041417	50168923013	Chromium, Hexavalent		U	0.64	2.0	mg/kg	2.0	U
USS-SS-PL01-041417-D	50168923015	Chromium	2.9		0.42	0.84	mg/kg	2.9	
USS-SS-PL01-041417-D	50168923015	Chromium, Hexavalent		U	0.65	2.0	mg/kg	2.0	U
USS-SS-PL02-041417	50168923014	Chromium	3.5		0.42	0.85	mg/kg	3.5	J
USS-SS-PL02-041417	50168923014	Chromium, Hexavalent		U	0.64	2.0	mg/kg	2.0	U
USS-SS-PL02-041417-D	50168923016	Chromium	10.0		0.42	0.84	mg/kg	10.0	J
USS-SS-PL02-041417-D	50168923016	Chromium, Hexavalent		U	0.65	2.0	mg/kg	2.0	U
USS-SS-WB01-041417	50168923009	Chromium	3.5		0.46	0.92	mg/kg	3.5	
USS-SS-WB01-041417	50168923009	Chromium, Hexavalent		U	0.65	2.0	mg/kg	2.0	U
USS-SS-WB02-041417	50168923010	Chromium	4.6		0.42	0.84	mg/kg	4.6	
USS-SS-WB02-041417	50168923010	Chromium, Hexavalent		U	0.65	2.0	mg/kg	2.0	U

DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Site Name	U.S. Steel Hexavalent Chrome Release	TDD No.	S05-0001-1704-201
Document Tracking No.	1688G	Technical Reviewer (signature and date)	<i>Jessica A. Vickers</i> May 1, 2017
Data Reviewer (signature and date)	<i>Harry N. Ellis III</i> 25 April 2017	Laboratory	Pace Analytical/Indianapolis, Indiana
Laboratory Report No.	50168924		
Analyses	Total chromium by EPA Method 200.7		
Samples and Matrix	72 Surface water samples and 7 field duplicates		
Field Duplicate Pairs	USS-SW-004-B-041417/USS-SW-004-B-041417-D, USS-SW-010-A-041417/USS-SW-010-A-041417-D, USS-SW-A001-A-041417/USS-SW-A001-A-041417-D, USS-SW-C002-B-041417/USS-SW-C002-B-041417-D, USS-SW-E001-A-041417/USS-SW-E001-A-041417-D, USS-SW-F001-B-041417/USS-SW-F001-B-041417-D, and USS-SW-H002-A-041417/USS-SW-H002-A-041417-D		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review* (January 2017).

OVERALL EVALUATION

No results were rejected or qualified. All may be used as reported.

Data completeness:

Within Criteria	Exceedance/Notes
Y	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
N	Four samples were received at the laboratory unpreserved (pH = 7). These samples (as well as the rest of the samples) were analyzed for total chromium only on the day after collection; therefore, no qualifications were applied.

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
NA	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field blanks:

Within Criteria	Exceedance/Notes
NA	

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
Y	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
NA	

MS/MSD:

Within Criteria	Exceedance/Notes
Y	

Post digestion spikes:

Within Criteria	Exceedance/Notes
Y	

Serial dilutions:

Within Criteria	Exceedance/Notes
Y	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Internal Standards:

Within Criteria	Exceedance/Notes
NA	

Target analyte identification:

Within Criteria	Exceedance/Notes
NA	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	All detected results were less than their reporting limits. The laboratory correctly qualified these as estimated (flagged “J”).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



U.S. Steel Hexavalent Chrome Water Results
Pace Analytical Report No. 50168924

Sample ID	Lab ID	Analyte	Lab Result	Lab Qualifier	DL	RL	Units	Val. Results	Val Qualifiers
USS-SW-002-A-041417	50168924051	Chromium	1.4	J	0.58	10.0	ug/L	1.4 J	
USS-SW-002-B-041417	50168924052	Chromium	1.6	J	0.58	10.0	ug/L	1.6 J	
USS-SW-003-A-041417	50168924053	Chromium	1.2	J	0.58	10.0	ug/L	1.2 J	
USS-SW-003-B-041417	50168924054	Chromium	1.6	J	0.58	10.0	ug/L	1.6 J	
USS-SW-004-A-041417	50168924055	Chromium	1.5	J	0.58	10.0	ug/L	1.5 J	
USS-SW-004-B-041417	50168924056	Chromium		U	0.58	10.0	ug/L	10 U	
USS-SW-004-B-041417-D	50168924079	Chromium	2.0	J	0.58	10.0	ug/L	2.0 J	
USS-SW-005-A-041417	50168924057	Chromium	0.84	J	0.58	10.0	ug/L	0.84 J	
USS-SW-005-B-041417	50168924058	Chromium		U	0.58	10.0	ug/L	10 U	
USS-SW-006-A-041417	50168924059	Chromium	1.5	J	0.58	10.0	ug/L	1.5 J	
USS-SW-006-B-041417	50168924060	Chromium	1.2	J	0.58	10.0	ug/L	1.2 J	
USS-SW-007-A-041417	50168924061	Chromium	1.4	J	0.58	10.0	ug/L	1.4 J	
USS-SW-007-B-041417	50168924062	Chromium	1.4	J	0.58	10.0	ug/L	1.4 J	
USS-SW-008-A-041417	50168924063	Chromium	1.4	J	0.58	10.0	ug/L	1.4 J	
USS-SW-008-B-041417	50168924064	Chromium	1.2	J	0.58	10.0	ug/L	1.2 J	
USS-SW-009-A-041417	50168924065	Chromium		U	0.58	10.0	ug/L	10 U	
USS-SW-009-B-041417	50168924066	Chromium	1.3	J	0.58	10.0	ug/L	1.3 J	
USS-SW-010-A-041417	50168924067	Chromium	0.86	J	0.58	10.0	ug/L	0.86 J	
USS-SW-010-A-041417-D	50168924078	Chromium	0.98	J	0.58	10.0	ug/L	0.98 J	
USS-SW-010-B-041417	50168924068	Chromium	0.94	J	0.58	10.0	ug/L	0.94 J	
USS-SW-011-A-041417	50168924069	Chromium	0.69	J	0.58	10.0	ug/L	0.69 J	
USS-SW-011-B-041417	50168924070	Chromium	1.2	J	0.58	10.0	ug/L	1.2 J	
USS-SW-012-A-041417	50168924071	Chromium	0.99	J	0.58	10.0	ug/L	0.99 J	
USS-SW-012-B-041417	50168924072	Chromium	1.5	J	0.58	10.0	ug/L	1.5 J	
USS-SW-A001-A-041417	50168924001	Chromium	1.2	J	0.58	10.0	ug/L	1.2 J	
USS-SW-A001-A-041417-D	50168924073	Chromium	1.2	J	0.58	10.0	ug/L	1.2 J	
USS-SW-A001-B-041417	50168924002	Chromium	1.4	J	0.58	10.0	ug/L	1.4 J	
USS-SW-A002-A-041417	50168924003	Chromium	1.4	J	0.58	10.0	ug/L	1.4 J	
USS-SW-A002-B-041417	50168924004	Chromium	1.1	J	0.58	10.0	ug/L	1.1 J	
USS-SW-A003-A-041417	50168924005	Chromium	1.3	J	0.58	10.0	ug/L	1.3 J	
USS-SW-A003-B-041417	50168924006	Chromium	1.8	J	0.58	10.0	ug/L	1.8 J	
USS-SW-B001-A-041417	50168924007	Chromium	1.7	J	0.58	10.0	ug/L	1.7 J	
USS-SW-B001-B-041417	50168924008	Chromium	1.4	J	0.58	10.0	ug/L	1.4 J	
USS-SW-B002-A-041417	50168924009	Chromium	1.5	J	0.58	10.0	ug/L	1.5 J	
USS-SW-B002-B-041417	50168924010	Chromium	1.3	J	0.58	10.0	ug/L	1.3 J	
USS-SW-B003-A-041417	50168924011	Chromium	1.9	J	0.58	10.0	ug/L	1.9 J	
USS-SW-B003-B-041417	50168924012	Chromium	1.4	J	0.58	10.0	ug/L	1.4 J	
USS-SW-C001-A-041417	50168924013	Chromium	1.7	J	0.58	10.0	ug/L	1.7 J	
USS-SW-C001-B-041417	50168924014	Chromium	1.9	J	0.58	10.0	ug/L	1.9 J	

U.S. Steel Hexavalent Chrome Water Results
Pace Analytical Report No. 50168924

Sample ID	Lab ID	Analyte	Lab Result	Lab Qualifier	DL	RL	Units	Val. Results	Val Qualifiers
USS-SW-C002-A-041417	50168924015	Chromium	1.4	J	0.58	10.0	ug/L	1.4 J	
USS-SW-C002-B-041417	50168924016	Chromium	1.3	J	0.58	10.0	ug/L	1.3 J	
USS-SW-C002-B-041417-D	50168924074	Chromium	1.8	J	0.58	10.0	ug/L	1.8 J	
USS-SW-C003-A-041417	50168924017	Chromium	4.3	J	0.58	10.0	ug/L	4.3 J	
USS-SW-C003-B-041417	50168924018	Chromium	5.7	J	0.58	10.0	ug/L	5.7 J	
USS-SW-D001-A-041417	50168924019	Chromium	1.8	J	0.58	10.0	ug/L	1.8 J	
USS-SW-D001-B-041417	50168924020	Chromium	2.0	J	0.58	10.0	ug/L	2.0 J	
USS-SW-D002-A-041417	50168924021	Chromium	1.4	J	0.58	10.0	ug/L	1.4 J	
USS-SW-D002-B-041417	50168924022	Chromium	0.91	J	0.58	10.0	ug/L	0.91 J	
USS-SW-D003-A-041417	50168924023	Chromium	1.3	J	0.58	10.0	ug/L	1.3 J	
USS-SW-D003-B-041417	50168924024	Chromium	1.9	J	0.58	10.0	ug/L	1.9 J	
USS-SW-E001-A-041417	50168924025	Chromium	1.6	J	0.58	10.0	ug/L	1.6 J	
USS-SW-E001-A-041417-D	50168924075	Chromium	1.6	J	0.58	10.0	ug/L	1.6 J	
USS-SW-E001-B-041417	50168924026	Chromium	0.78	J	0.58	10.0	ug/L	0.78 J	
USS-SW-E002-A-041417	50168924027	Chromium	2.0	J	0.58	10.0	ug/L	2.0 J	
USS-SW-E002-B-041417	50168924028	Chromium	0.90	J	0.58	10.0	ug/L	0.9 J	
USS-SW-E003-A-041417	50168924029	Chromium	2.7	J	0.58	10.0	ug/L	2.7 J	
USS-SW-E003-B-041417	50168924030	Chromium	1.8	J	0.58	10.0	ug/L	1.8 J	
USS-SW-F001-A-041417	50168924031	Chromium	1.6	J	0.58	10.0	ug/L	1.6 J	
USS-SW-F001-B-041417	50168924032	Chromium	0.68	J	0.58	10.0	ug/L	0.68 J	
USS-SW-F001-B-041417-D	50168924076	Chromium	1.4	J	0.58	10.0	ug/L	1.4 J	
USS-SW-F002-A-041417	50168924033	Chromium	1.0	J	0.58	10.0	ug/L	1.0 J	
USS-SW-F002-B-041417	50168924034	Chromium	1.7	J	0.58	10.0	ug/L	1.7 J	
USS-SW-F003-A-041417	50168924035	Chromium	1.5	J	0.58	10.0	ug/L	1.5 J	
USS-SW-F003-B-041417	50168924036	Chromium	1.7	J	0.58	10.0	ug/L	1.7 J	
USS-SW-G001-A-041417	50168924037	Chromium	0.60	J	0.58	10.0	ug/L	0.60 J	
USS-SW-G001-B-041417	50168924038	Chromium	0.87	J	0.58	10.0	ug/L	0.87 J	
USS-SW-G002-A-041417	50168924039	Chromium	1.7	J	0.58	10.0	ug/L	1.7 J	
USS-SW-G002-B-041417	50168924040	Chromium	1.6	J	0.58	10.0	ug/L	1.6 J	
USS-SW-G003-A-041417	50168924041	Chromium	1.3	J	0.58	10.0	ug/L	1.3 J	
USS-SW-G003-B-041417	50168924042	Chromium	1.4	J	0.58	10.0	ug/L	1.4 J	
USS-SW-H001-A-041417	50168924043	Chromium	2.1	J	0.58	10.0	ug/L	2.1 J	
USS-SW-H001-B-041417	50168924044	Chromium	1.5	J	0.58	10.0	ug/L	1.5 J	
USS-SW-H002-A-041417	50168924045	Chromium	1.7	J	0.58	10.0	ug/L	1.7 J	
USS-SW-H002-A-041417-D	50168924077	Chromium	1.4	J	0.58	10.0	ug/L	1.4 J	
USS-SW-H002-B-041417	50168924046	Chromium	2.3	J	0.58	10.0	ug/L	2.3 J	
USS-SW-H003-A-041417	50168924047	Chromium	2.7	J	0.58	10.0	ug/L	2.7 J	
USS-SW-H003-B-041417	50168924048	Chromium	1.4	J	0.58	10.0	ug/L	1.4 J	
USS-SW-Intake-A-041417	50168924049	Chromium		U	0.58	10.0	ug/L	10 U	

U.S. Steel Hexavalent Chrome Water Results
Pace Analytical Report No. 50168924

Sample ID	Lab ID	Analyte	Lab Result	Lab Qualifier	DL	RL	Units	Val. Results	Val Qualifiers
USS-SW-Intake-B-041417	50168924050	Chromium	1.1	J	0.58	10.0	ug/L	1.1	J

DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Site Name	U.S. Steel Hexavalent Chrome Release	TDD No.	S05-0001-1704-201
Document Tracking No.	1688H	Technical Reviewer (signature and date)	<i>Jessica A. Vickers</i> May 1, 2017
Data Reviewer (signature and date)	<i>Harry N. Ellis III</i> 25 April 2017	Laboratory	Pace Analytical/Indianapolis, Indiana
Laboratory Report No.	50168934		
Analyses	Hexavalent chromium by SW-846 Method 7196A and total chromium by SW-846 Method 6010B		
Samples and Matrix	14 Surface soil samples and 2 field duplicates		
Field Duplicate Pairs	USS-SS-OD01-041517/USS-SS-OD01-041517-D and USS-SS-PB02-041517/USS-SS-PB02-041517-D		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review* (January 2017).

OVERALL EVALUATION

Results were neither rejected nor qualified. All may be used as reported.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
NA	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
Y	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
NA	

MS/MSD:

Within Criteria	Exceedance/Notes
Y	

Post digestion spikes:

Within Criteria	Exceedance/Notes
Y	

Serial dilutions:

Within Criteria	Exceedance/Notes
Y	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
Y	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
NA	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	All total chromium results were above the RL, while all hexavalent chromium results were non-detect.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



U.S. Steel Hexavalent Chrome Soil Reslts
Pace Analytical Report No. 50168934

Sample ID	Lab Sample	Analyte	Lab Result	Lab Qualifier	DL	RL	Units	Val. Results	Val. Qualifiers
USS-SS-BB01-041517	50168934007	Chromium	4.1		0.44	0.88	mg/kg	4.1	
USS-SS-BB01-041517	50168934007	Chromium, Hexavalent		U	0.65	2.0	mg/kg	2.0	U
USS-SS-BB02-041517	50168934008	Chromium	3.6		0.45	0.90	mg/kg	3.6	
USS-SS-BB02-041517	50168934008	Chromium, Hexavalent		U	0.66	2.0	mg/kg	2.0	U
USS-SS-DB01-041517	50168934001	Chromium	3.4		0.44	0.88	mg/kg	3.4	
USS-SS-DB01-041517	50168934001	Chromium, Hexavalent		U	0.66	2.0	mg/kg	2.0	U
USS-SS-DB02-041517	50168934002	Chromium	3.5		0.48	0.96	mg/kg	3.5	
USS-SS-DB02-041517	50168934002	Chromium, Hexavalent		U	0.66	2.0	mg/kg	2.0	U
USS-SS-KB01-041517	50168934003	Chromium	2.8		0.43	0.85	mg/kg	2.8	
USS-SS-KB01-041517	50168934003	Chromium, Hexavalent		U	0.66	2.0	mg/kg	2.0	U
USS-SS-KB02-041517	50168934004	Chromium	2.9		0.45	0.89	mg/kg	2.9	
USS-SS-KB02-041517	50168934004	Chromium, Hexavalent		U	0.66	2.0	mg/kg	2.0	U
USS-SS-OD01-041517	50168934011	Chromium	5.9		0.44	0.88	mg/kg	5.9	
USS-SS-OD01-041517	50168934011	Chromium, Hexavalent		U	0.65	2.0	mg/kg	2.0	U
USS-SS-OD01-041517-D	50168934015	Chromium	3.2		0.48	0.97	mg/kg	3.2	
USS-SS-OD01-041517-D	50168934015	Chromium, Hexavalent		U	0.66	2.0	mg/kg	2.0	U
USS-SS-OD02-041517	50168934012	Chromium	1.4		0.46	0.92	mg/kg	1.4	
USS-SS-OD02-041517	50168934012	Chromium, Hexavalent		U	0.65	2.0	mg/kg	2.0	U
USS-SS-PB01-041517	50168934005	Chromium	2.8		0.46	0.91	mg/kg	2.8	
USS-SS-PB01-041517	50168934005	Chromium, Hexavalent		U	0.65	2.0	mg/kg	2.0	U
USS-SS-PB02-041517	50168934006	Chromium	2.9		0.44	0.88	mg/kg	2.9	
USS-SS-PB02-041517	50168934006	Chromium, Hexavalent		U	0.66	2.0	mg/kg	2.0	U
USS-SS-PB02-041517-D	50168934016	Chromium	3.9		0.43	0.86	mg/kg	3.9	
USS-SS-PB02-041517-D	50168934016	Chromium, Hexavalent		U	0.66	2.0	mg/kg	2.0	U
USS-SS-PL01-041517	50168934013	Chromium	4.6		0.49	0.98	mg/kg	4.6	
USS-SS-PL01-041517	50168934013	Chromium, Hexavalent		U	0.65	2.0	mg/kg	2.0	U
USS-SS-PL02-041517	50168934014	Chromium	5.6		0.43	0.86	mg/kg	5.6	
USS-SS-PL02-041517	50168934014	Chromium, Hexavalent		U	0.65	2.0	mg/kg	2.0	U
USS-SS-WB01-041517	50168934009	Chromium	3.9		0.42	0.84	mg/kg	3.9	
USS-SS-WB01-041517	50168934009	Chromium, Hexavalent		U	0.66	2.0	mg/kg	2.0	U
USS-SS-WB02-041517	50168934010	Chromium	3.0		0.45	0.90	mg/kg	3.0	
USS-SS-WB02-041517	50168934010	Chromium, Hexavalent		U	0.64	2.0	mg/kg	2.0	U

DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Site Name	U.S. Steel Hexavalent Chrome Release	TDD No.	S05-0001-1704-201
Document Tracking No.	1688I	Technical Reviewer (signature and date)	<i>Jessica A. Vickers</i> May 1, 2017
Data Reviewer (signature and date)	<i>Harry N. Ellis III</i> 26 April 2017	Laboratory	Pace Analytical/Indianapolis, Indiana
Laboratory Report No.	50168935		
Analyses	Total chromium by EPA Method 200.7		
Samples and Matrix	71 Surface water samples		
Field Duplicate Pairs	None		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review* (January 2017).

OVERALL EVALUATION

No samples were rejected or qualified. All may be used as reported.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
N	Two samples were received at the laboratory unpreserved (pH = 7). The samples were analyzed for total chromium on the day after collection; therefore, no qualifications were applied.



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
NA	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
Y	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
NA	

MS/MSD:

Within Criteria	Exceedance/Notes
Y	

Post digestion spikes:

Within Criteria	Exceedance/Notes
Y	

Serial dilutions:

Within Criteria	Exceedance/Notes
Y	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
Y	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Target analyte identification:

Within Criteria	Exceedance/Notes
NA	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	Detected chromium concentrations less than the sample reporting limit were correctly qualified as estimated (flagged “J”) by the laboratory.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



U.S. Steel Hexavalent Chrome Surface Water Results
Pace Analytical Report No. 50168935

Sample ID	Lab ID	Analyte	Lab Result	Lab Qualifier	DL	RL	Dilution	Units	Val. Results	Val. Qualifiers
USS-SW-002A-041517	50168935051	Chromium	1.3	J	0.58	10.0	1	ug/L	1.3 J	
USS-SW-002B-041517	50168935052	Chromium	1.2	J	0.58	10.0	1	ug/L	1.2 J	
USS-SW-003A-041517	50168935053	Chromium	1.8	J	0.58	10.0	1	ug/L	1.8 J	
USS-SW-003B-041517	50168935054	Chromium	0.96	J	0.58	10.0	1	ug/L	0.96 J	
USS-SW-004A-041517	50168935055	Chromium	2.2	J	0.58	10.0	1	ug/L	2.2 J	
USS-SW-004B-041517	50168935056	Chromium	1.3	J	0.58	10.0	1	ug/L	1.3 J	
USS-SW-005A-041517	50168935057	Chromium	1.7	J	0.58	10.0	1	ug/L	1.7 J	
USS-SW-005B-041517	50168935058	Chromium	0.67	J	0.58	10.0	1	ug/L	0.67 J	
USS-SW-006A-041517	50168935059	Chromium	0.82	J	0.58	10.0	1	ug/L	0.82 J	
USS-SW-006B-041517	50168935060	Chromium	1.9	J	0.58	10.0	1	ug/L	1.9 J	
USS-SW-007-A-041517	50168935061	Chromium	1.4	J	0.58	10.0	1	ug/L	1.4 J	
USS-SW-007-B-041517	50168935062	Chromium	1.2	J	0.58	10.0	1	ug/L	1.2 J	
USS-SW-008-A-041517	50168935063	Chromium		U	0.58	10.0	1	ug/L	10 U	
USS-SW-008-B-041517	50168935064	Chromium	1.9	J	0.58	10.0	1	ug/L	1.9 J	
USS-SW-009-A-041517	50168935065	Chromium	1.9	J	0.58	10.0	1	ug/L	1.9 J	
USS-SW-009-B-041517	50168935066	Chromium	1.1	J	0.58	10.0	1	ug/L	1.1 J	
USS-SW-010-A-041517	50168935067	Chromium	1.7	J	0.58	10.0	1	ug/L	1.7 J	
USS-SW-010-B-041517	50168935068	Chromium	1.2	J	0.58	10.0	1	ug/L	1.2 J	
USS-SW-011-A-041517	50168935069	Chromium	1.5	J	0.58	10.0	1	ug/L	1.5 J	
USS-SW-011-B-041517	50168935070	Chromium	1.2	J	0.58	10.0	1	ug/L	1.2 J	
USS-SW-012-A-041517	50168935071	Chromium	1.3	J	0.58	10.0	1	ug/L	1.3 J	
USS-SW-012-B-041517	50168935072	Chromium	0.97	J	0.58	10.0	1	ug/L	0.97 J	
USS-SW-A001-A-041517	50168935001	Chromium	1.5	J	0.58	10.0	1	ug/L	1.5 J	
USS-SW-A001-B-041517	50168935002	Chromium	2.4	J	0.58	10.0	1	ug/L	2.4 J	
USS-SW-A002-A-041517	50168935003	Chromium	2.2	J	0.58	10.0	1	ug/L	2.2 J	
USS-SW-A002-B-041517	50168935004	Chromium	2.2	J	0.58	10.0	1	ug/L	2.2 J	
USS-SW-A003-A-041517	50168935005	Chromium	1.8	J	0.58	10.0	1	ug/L	1.8 J	
USS-SW-A003-B-041517	50168935006	Chromium	1.4	J	0.58	10.0	1	ug/L	1.4 J	
USS-SW-B001-A-041517	50168935007	Chromium	2.3	J	0.58	10.0	1	ug/L	2.3 J	
USS-SW-B001-B-041517	50168935008	Chromium	2.8	J	0.58	10.0	1	ug/L	2.8 J	
USS-SW-B002-A-041517	50168935009	Chromium	1.5	J	0.58	10.0	1	ug/L	1.5 J	
USS-SW-B002-B-041517	50168935010	Chromium	2.7	J	0.58	10.0	1	ug/L	2.7 J	
USS-SW-B003-A-041517	50168935011	Chromium	2.3	J	0.58	10.0	1	ug/L	2.3 J	
USS-SW-B003-B-041517	50168935012	Chromium	6.4	J	0.58	10.0	1	ug/L	6.4 J	
USS-SW-C001-A-041517	50168935013	Chromium	1.9	J	0.58	10.0	1	ug/L	1.9 J	
USS-SW-C001-B-041517	50168935014	Chromium	2.4	J	0.58	10.0	1	ug/L	2.4 J	
USS-SW-C002-A-041517	50168935015	Chromium	1.9	J	0.58	10.0	1	ug/L	1.9 J	
USS-SW-C002-B-041517	50168935016	Chromium	1.4	J	0.58	10.0	1	ug/L	1.4 J	
USS-SW-C003-A-041517	50168935017	Chromium	1.9	J	0.58	10.0	1	ug/L	1.9 J	

U.S. Steel Hexavalent Chrome Surface Water Results
Pace Analytical Report No. 50168935

Sample ID	Lab ID	Analyte	Lab Result	Lab Qualifier	DL	RL	Dilution	Units	Val. Results	Val. Qualifiers
USS-SW-C003-B-041517	50168935018	Chromium	2.2	J	0.58	10.0	1	ug/L	2.2 J	
USS-SW-D001-A-041517	50168935019	Chromium	2.0	J	0.58	10.0	1	ug/L	2.0 J	
USS-SW-D001-B-041517	50168935020	Chromium	1.6	J	0.58	10.0	1	ug/L	1.6 J	
USS-SW-D002-A-041517	50168935021	Chromium	1.8	J	0.58	10.0	1	ug/L	1.8 J	
USS-SW-D002-B-041517	50168935022	Chromium	2.3	J	0.58	10.0	1	ug/L	2.3 J	
USS-SW-D003-A-041517	50168935023	Chromium	8.6	J	0.58	10.0	1	ug/L	8.6 J	
USS-SW-D003-B-041517	50168935024	Chromium	10.3		0.58	10.0	1	ug/L	10.3	
USS-SW-E001-A-041517	50168935025	Chromium	2.5	J	0.58	10.0	1	ug/L	2.5 J	
USS-SW-E001-B-041517	50168935026	Chromium	2.0	J	0.58	10.0	1	ug/L	2.0 J	
USS-SW-E002-A-041517	50168935027	Chromium	1.9	J	0.58	10.0	1	ug/L	1.9 J	
USS-SW-E002-B-041517	50168935028	Chromium	2.3	J	0.58	10.0	1	ug/L	2.3 J	
USS-SW-E003-A-041517	50168935029	Chromium	2.4	J	0.58	10.0	1	ug/L	2.4 J	
USS-SW-E003-B-041517	50168935030	Chromium	1.8	J	0.58	10.0	1	ug/L	1.8 J	
USS-SW-F001-A-041517	50168935031	Chromium	1.6	J	0.58	10.0	1	ug/L	1.6 J	
USS-SW-F001-B-041517	50168935032	Chromium	2.5	J	0.58	10.0	1	ug/L	2.5 J	
USS-SW-F002-A-041517	50168935033	Chromium	2.2	J	0.58	10.0	1	ug/L	2.2 J	
USS-SW-F002-B-041517	50168935034	Chromium	1.6	J	0.58	10.0	1	ug/L	1.6 J	
USS-SW-F003-A-041517	50168935035	Chromium	2.2	J	0.58	10.0	1	ug/L	2.2 J	
USS-SW-G001-A-041517	50168935037	Chromium	1.8	J	0.58	10.0	1	ug/L	1.8 J	
USS-SW-G001-B-041517	50168935038	Chromium	2.0	J	0.58	10.0	1	ug/L	2.0 J	
USS-SW-G002-A-041517	50168935039	Chromium	1.6	J	0.58	10.0	1	ug/L	1.6 J	
USS-SW-G002-B-041517	50168935040	Chromium	1.5	J	0.58	10.0	1	ug/L	1.5 J	
USS-SW-G003-A-041517	50168935041	Chromium	2.6	J	0.58	10.0	1	ug/L	2.6 J	
USS-SW-G003-B-041517	50168935042	Chromium	3.2	J	0.58	10.0	1	ug/L	3.2 J	
USS-SW-H001-A-041517	50168935043	Chromium	1.9	J	0.58	10.0	1	ug/L	1.9 J	
USS-SW-H001-B-041517	50168935044	Chromium	1.6	J	0.58	10.0	1	ug/L	1.6 J	
USS-SW-H002-A-041517	50168935045	Chromium	1.7	J	0.58	10.0	1	ug/L	1.7 J	
USS-SW-H002-B-041517	50168935046	Chromium	2.6	J	0.58	10.0	1	ug/L	2.6 J	
USS-SW-H003-A-041517	50168935047	Chromium	2.4	J	0.58	10.0	1	ug/L	2.4 J	
USS-SW-H003-B-041517	50168935048	Chromium	2.9	J	0.58	10.0	1	ug/L	2.9 J	
USS-SW-Intake-A-041517	50168935049	Chromium	0.90	J	0.58	10.0	1	ug/L	0.90 J	
USS-SW-Intake-B-041517	50168935050	Chromium	1.3	J	0.58	10.0	1	ug/L	1.3 J	

DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Site Name	U.S. Steel Hexavalent Chrome Release	TDD No.	S05-0001-1704-201
Document Tracking No.	1688J	Technical Reviewer (signature and date)	<i>Jessica A. Vickers</i> May 2, 2017
Data Reviewer (signature and date)	<i>Harry N. Ellis III</i> 26 April 2017	Laboratory	Pace Analytical/Indianapolis, Indiana
Laboratory Report No.	50168936		
Analyses	Hexavalent chromium by SW-846 Method 7196A and total chromium by SW-846 Method 6010B		
Samples and Matrix	14 Surface soil samples and 2 field duplicates		
Field Duplicate Pairs	USS-SS-BB01-041617/USS-SS-BB01-041617-D and USS-SS-WB02-041617/USS-SS-WB02-041617-D		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review* (January 2017).

OVERALL EVALUATION

No results were rejected, but one was qualified as detailed below.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
NA	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
Y	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
NA	

MS/MSD:

Within Criteria	Exceedance/Notes
N	MS/MSD analyses were performed on sample USS-SS-DB01-041617. The first hexavalent chromium MS/MSD analyses, performed using a spike concentration about 5 times the unspiked concentration, yielded recoveries of 70 and 70 percent, while the second set, performed using a spike more than 100 times the unspiked concentration yielded recoveries of 101 and 89 percent. These results indicate matrix interference at concentrations near those found in the unspiked sample; therefore, the result for the parent sample was qualified as estimated, possibly biased low (flagged "J-").

Post digestion spikes:

Within Criteria	Exceedance/Notes
Y	

Serial dilutions:

Within Criteria	Exceedance/Notes
Y	



DATA VALIDATION CHECKLIST – STAGE 4 **EPA REGION 5 START CONTRACT**

Laboratory duplicates:

Within Criteria	Exceedance/Notes
Y	

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Internal Standards:

Within Criteria	Exceedance/Notes
NA	

Target analyte identification:

Within Criteria	Exceedance/Notes
NA	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	All total chromium results were above the RL, while all hexavalent chromium results except one were non-detect.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



U.S. Steel Hexavalent Chrome Soil Results
Pace Analytical Report No. 50168936

Sample ID	Lab ID	Analyte	Lab Result	Lab Qualifier	DL	RL	Units	Val. Results	Val. Qualifiers
USS-SS-BB01-041617	50168936007	Chromium	6.6		0.47	0.95	mg/kg	6.6	
USS-SS-BB01-041617	50168936007	Chromium, Hexavalent		U	0.66	2.0	mg/kg	2.0	U
USS-SS-BB01-041617-D	50168936016	Chromium	3.4		0.46	0.92	mg/kg	3.4	
USS-SS-BB01-041617-D	50168936016	Chromium, Hexavalent		U	0.64	2.0	mg/kg	2.0	U
USS-SS-BB02-041617	50168936008	Chromium	5.1		0.48	0.97	mg/kg	5.1	
USS-SS-BB02-041617	50168936008	Chromium, Hexavalent		U	0.65	2.0	mg/kg	2.0	U
USS-SS-DB01-041617	50168936001	Chromium	5.4		0.49	0.98	mg/kg	5.4	
USS-SS-DB01-041617	50168936001	Chromium, Hexavalent	7.3		0.64	2.0	mg/kg	7.3	J-
USS-SS-DB02-041617	50168936002	Chromium	4.3		0.45	0.91	mg/kg	4.3	
USS-SS-DB02-041617	50168936002	Chromium, Hexavalent		U	0.63	1.9	mg/kg	1.9	U
USS-SS-KB01-041617	50168936003	Chromium	2.0		0.48	0.95	mg/kg	2.0	
USS-SS-KB01-041617	50168936003	Chromium, Hexavalent		U	0.64	2.0	mg/kg	2.0	U
USS-SS-KB02-041617	50168936004	Chromium	1.4		0.44	0.88	mg/kg	1.4	
USS-SS-KB02-041617	50168936004	Chromium, Hexavalent		U	0.64	2.0	mg/kg	2.0	U
USS-SS-OD01-041617	50168936011	Chromium	2.2		0.45	0.90	mg/kg	2.2	
USS-SS-OD01-041617	50168936011	Chromium, Hexavalent		U	0.66	2.0	mg/kg	2.0	U
USS-SS-OD02-041617	50168936012	Chromium	3.4		0.48	0.96	mg/kg	3.4	
USS-SS-OD02-041617	50168936012	Chromium, Hexavalent		U	0.65	2.0	mg/kg	2.0	U
USS-SS-PB01-041617	50168936005	Chromium	3.9		0.50	1.0	mg/kg	3.9	
USS-SS-PB01-041617	50168936005	Chromium, Hexavalent		U	0.64	2.0	mg/kg	2.0	U
USS-SS-PB02-041617	50168936006	Chromium	1.9		0.45	0.90	mg/kg	1.9	
USS-SS-PB02-041617	50168936006	Chromium, Hexavalent		U	0.66	2.0	mg/kg	2.0	U
USS-SS-PL01-041617	50168936013	Chromium	3.5		0.44	0.87	mg/kg	3.5	
USS-SS-PL01-041617	50168936013	Chromium, Hexavalent		U	0.66	2.0	mg/kg	2.0	U
USS-SS-PL02-041617	50168936014	Chromium	2.4		0.44	0.87	mg/kg	2.4	
USS-SS-PL02-041617	50168936014	Chromium, Hexavalent		U	0.64	2.0	mg/kg	2.0	U
USS-SS-WB01-041617	50168936009	Chromium	3.8		0.48	0.97	mg/kg	3.8	
USS-SS-WB01-041617	50168936009	Chromium, Hexavalent		U	0.63	1.9	mg/kg	1.9	U
USS-SS-WB02-041617	50168936010	Chromium	1.6		0.44	0.88	mg/kg	1.6	
USS-SS-WB02-041617	50168936010	Chromium, Hexavalent		U	0.65	2.0	mg/kg	2.0	U
USS-SS-WB02-041617-D	50168936015	Chromium	3.3		0.44	0.87	mg/kg	3.3	
USS-SS-WB02-041617-D	50168936015	Chromium, Hexavalent		U	0.64	2.0	mg/kg	2.0	U

DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Site Name	U.S. Steel Hexavalent Chrome Release	TDD No.	S05-0001-1704-201
Document Tracking No.	1688K	Technical Reviewer (signature and date)	<i>Jessica A. Vickers</i> May 2, 2017
Data Reviewer (signature and date)	<i>Harry N. Ellis III</i> 26 April 2017	Laboratory	Pace Analytical/Indianapolis, Indiana
Laboratory Report No.	50168937		
Analyses	Total chromium by EPA Method 200.7		
Samples and Matrix	73 Surface water samples		
Field Duplicate Pairs	None		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review* (January 2017).

OVERALL EVALUATION

No results were rejected, but a number were qualified for laboratory blank contamination. All may be used as qualified.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	Thirteen samples were received at the laboratory insufficiently preserved (pH = 3). All samples were analyzed for total chromium the day after collection; therefore, no qualifications were applied.



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
NA	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
N	One of the method blanks (Lab No. 1764225) yielded a low concentration (below reporting limit) of chromium. The results for USS-SW-A001-A-041617, USS-SW-A001-B-041617, USS-SW-A002-A-041617, USS-SW-A002-B-041617, USS-SW-A003-A-041617, USS-SW-A003-B-041617, USS-SW-B001-A-041617, USS-SW-B001-B-041617, USS-SW-B002-A-041617, USS-SW-B002-B-041617, USS-SW-B003-B-041617, USS-SW-C001-A-041617, USS-SW-C001-B-041617, USS-SW-C002-A-041617, USS-SW-C002-B-041617, USS-SW-C003-A-041617, USS-SW-C003-B-041617, USS-SW-D001-A-041617, USS-SW-D001-B-041617, and USS-SW-D002-A-041617 (which represents all samples associated with this blank) were raised to the reporting limit and qualified as laboratory artifacts (flagged "U").



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Field blanks:

Within Criteria	Exceedance/Notes
NA	

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
Y	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
NA	

MS/MSD:

Within Criteria	Exceedance/Notes
Y	

Post digestion spikes:

Within Criteria	Exceedance/Notes
Y	

Serial dilutions:

Within Criteria	Exceedance/Notes
Y	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Internal Standards:

Within Criteria	Exceedance/Notes
NA	

Target analyte identification:

Within Criteria	Exceedance/Notes
NA	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	All detected results were less than their reporting limits. The laboratory correctly qualified these as estimated (flagged “J”).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



U.S. Steel Hexavalent Chrome Water Results
Pace Analytical Report No. 50168937

Sample ID	Lab ID	Analyte	Lab Result	Lab Qualifier	DL	RL	Units	Val. Results	Val. Qualifiers
USS-SW-002A-041617	50168937051	Chromium	1.2	J	0.58	10.0	ug/L	1.2 J	
USS-SW-002B-041617	50168937052	Chromium	1.2	J	0.58	10.0	ug/L	1.2 J	
USS-SW-003A-041617	50168937053	Chromium	1.5	J	0.58	10.0	ug/L	1.5 J	
USS-SW-003B-041617	50168937054	Chromium		U	0.58	10.0	ug/L	10 U	
USS-SW-004A-041617	50168937055	Chromium	0.97	J	0.58	10.0	ug/L	0.97 J	
USS-SW-004B-041617	50168937056	Chromium	1.4	J	0.58	10.0	ug/L	1.4 J	
USS-SW-005A-041617	50168937057	Chromium	0.98	J	0.58	10.0	ug/L	0.98 J	
USS-SW-005B-041617	50168937058	Chromium	1.2	J	0.58	10.0	ug/L	1.2 J	
USS-SW-006A-041617	50168937059	Chromium	1.5	J	0.58	10.0	ug/L	1.5 J	
USS-SW-006B-041617	50168937060	Chromium	1.0	J	0.58	10.0	ug/L	1.0 J	
USS-SW-007-A-041617	50168937061	Chromium	1.6	J	0.58	10.0	ug/L	1.6 J	
USS-SW-007-B-041617	50168937062	Chromium	1.1	J	0.58	10.0	ug/L	1.1 J	
USS-SW-008-A-041617	50168937064	Chromium	1.2	J	0.58	10.0	ug/L	1.2 J	
USS-SW-008-B-041617	50168937065	Chromium	1.9	J	0.58	10.0	ug/L	1.9 J	
USS-SW-009-A-041617	50168937066	Chromium	0.96	J	0.58	10.0	ug/L	0.96 J	
USS-SW-009-B-041617	50168937067	Chromium	1.8	J	0.58	10.0	ug/L	1.8 J	
USS-SW-010-A-041617	50168937068	Chromium	1.6	J	0.58	10.0	ug/L	1.6 J	
USS-SW-010-B-041617	50168937069	Chromium	1.7	J	0.58	10.0	ug/L	1.7 J	
USS-SW-011-A-041617	50168937070	Chromium	1.5	J	0.58	10.0	ug/L	1.5 J	
USS-SW-011-B-041617	50168937071	Chromium	1.2	J	0.58	10.0	ug/L	1.2 J	
USS-SW-012-A-041617	50168937072	Chromium	1.1	J	0.58	10.0	ug/L	1.1 J	
USS-SW-012-B-041617	50168937073	Chromium	1.1	J	0.58	10.0	ug/L	1.1 J	
USS-SW-A001-A-041617	50168937001	Chromium	2.1	J	0.58	10.0	ug/L	10 U	
USS-SW-A001-B-041617	50168937002	Chromium	2.1	J	0.58	10.0	ug/L	10 U	
USS-SW-A002-A-041617	50168937003	Chromium	1.9	J	0.58	10.0	ug/L	10 U	
USS-SW-A002-B-041617	50168937004	Chromium	1.7	J	0.58	10.0	ug/L	10 U	
USS-SW-A003-A-041617	50168937005	Chromium	1.8	J	0.58	10.0	ug/L	10 U	
USS-SW-A003-B-041617	50168937006	Chromium	2.0	J	0.58	10.0	ug/L	10 U	
USS-SW-B001-A-041617	50168937007	Chromium	1.9	J	0.58	10.0	ug/L	10 U	
USS-SW-B001-B-041617	50168937008	Chromium	1.3	J	0.58	10.0	ug/L	10 U	
USS-SW-B002-A-041617	50168937009	Chromium	1.6	J	0.58	10.0	ug/L	10 U	
USS-SW-B002-B-041617	50168937010	Chromium	1.4	J	0.58	10.0	ug/L	10 U	
USS-SW-B003-A-041617	50168937011	Chromium	2.0	J	0.58	10.0	ug/L	2.0 J	
USS-SW-B003-B-041617	50168937012	Chromium	2.7	J	0.58	10.0	ug/L	10 U	
USS-SW-C001-A-041617	50168937013	Chromium	2.7	J	0.58	10.0	ug/L	10 U	
USS-SW-C001-B-041617	50168937014	Chromium	8.8	J	0.58	10.0	ug/L	10 U	
USS-SW-C002-A-041617	50168937015	Chromium	1.4	J	0.58	10.0	ug/L	10 U	

U.S. Steel Hexavalent Chrome Water Results
Pace Analytical Report No. 50168937

Sample ID	Lab ID	Analyte	Lab Result	Lab Qualifier	DL	RL	Units	Val. Results	Val. Qualifiers
USS-SW-C002-B-041617	50168937016	Chromium	1.6	J	0.58	10.0	ug/L	10 U	
USS-SW-C003-A-041617	50168937017	Chromium	1.3	J	0.58	10.0	ug/L	10 U	
USS-SW-C003-B-041617	50168937018	Chromium	1.9	J	0.58	10.0	ug/L	10 U	
USS-SW-D001-A-041617	50168937019	Chromium	1.1	J	0.58	10.0	ug/L	10 U	
USS-SW-D001-B-041617	50168937020	Chromium	1.8	J	0.58	10.0	ug/L	10 U	
USS-SW-D002-A-041617	50168937021	Chromium	1.9	J	0.58	10.0	ug/L	10 U	
USS-SW-D002-B-041617	50168937022	Chromium	2.3	J	0.58	10.0	ug/L	2.3 J	
USS-SW-D003-A-041617	50168937023	Chromium	4.2	J	0.58	10.0	ug/L	4.2 J	
USS-SW-D003-B-041617	50168937024	Chromium	3.7	J	0.58	10.0	ug/L	3.7 J	
USS-SW-E001-A-041617	50168937025	Chromium	1.1	J	0.58	10.0	ug/L	1.1 J	
USS-SW-E001-B-041617	50168937026	Chromium	2.8	J	0.58	10.0	ug/L	2.8 J	
USS-SW-E002-A-041617	50168937027	Chromium	2.2	J	0.58	10.0	ug/L	2.2 J	
USS-SW-E002-B-041617	50168937028	Chromium	2.1	J	0.58	10.0	ug/L	2.1 J	
USS-SW-E003-A-041617	50168937029	Chromium	1.9	J	0.58	10.0	ug/L	1.9 J	
USS-SW-E003-B-041617	50168937030	Chromium	2.2	J	0.58	10.0	ug/L	2.2 J	
USS-SW-F001-A-041617	50168937031	Chromium	2.2	J	0.58	10.0	ug/L	2.2 J	
USS-SW-F001-B-041617	50168937032	Chromium	1.6	J	0.58	10.0	ug/L	1.6 J	
USS-SW-F002-A-041617	50168937033	Chromium	2.9	J	0.58	10.0	ug/L	2.9 J	
USS-SW-F002-B-041617	50168937034	Chromium	1.9	J	0.58	10.0	ug/L	1.9 J	
USS-SW-F003-A-041617	50168937035	Chromium	2.4	J	0.58	10.0	ug/L	2.4 J	
USS-SW-F003-B-041617	50168937036	Chromium	2.1	J	0.58	10.0	ug/L	2.1 J	
USS-SW-G001-A-041617	50168937037	Chromium	1.8	J	0.58	10.0	ug/L	1.8 J	
USS-SW-G001-B-041617	50168937038	Chromium	2.3	J	0.58	10.0	ug/L	2.3 J	
USS-SW-G002-A-041617	50168937039	Chromium	2.1	J	0.58	10.0	ug/L	2.1 J	
USS-SW-G002-B-041617	50168937040	Chromium	2.6	J	0.58	10.0	ug/L	2.6 J	
USS-SW-G003-A-041617	50168937041	Chromium	2.1	J	0.58	10.0	ug/L	2.1 J	
USS-SW-G003-B-041617	50168937042	Chromium	3.4	J	0.58	10.0	ug/L	3.4 J	
USS-SW-H001-A-041617	50168937043	Chromium	2.2	J	0.58	10.0	ug/L	2.2 J	
USS-SW-H001-B-041617	50168937044	Chromium	1.7	J	0.58	10.0	ug/L	1.7 J	
USS-SW-H002-A-041617	50168937045	Chromium	2.3	J	0.58	10.0	ug/L	2.3 J	
USS-SW-H002-B-041617	50168937046	Chromium	2.3	J	0.58	10.0	ug/L	2.3 J	
USS-SW-H003-A-041617	50168937047	Chromium	2.5	J	0.58	10.0	ug/L	2.5 J	
USS-SW-H003-B-041617	50168937048	Chromium	2.8	J	0.58	10.0	ug/L	2.8 J	
USS-SW-Intake-A-041617	50168937049	Chromium	1.0	J	0.58	10.0	ug/L	1.0 J	
USS-SW-Intake-B-041617	50168937050	Chromium	0.78	J	0.58	10.0	ug/L	0.78 J	

DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Site Name	U.S. Steel Hexavalent Chrome Release	TDD No.	S05-0001-1704-201
Document Tracking No.	1688L	Technical Reviewer (signature and date)	<i>Jessica A. Vickers</i> May 2, 2017
Data Reviewer (signature and date)	<i>Harry N. Ellis III</i> 26 April 2017	Laboratory	Pace Analytical/Indianapolis, Indiana
Laboratory Report No.	50168998		
Analyses	Total chromium by EPA Method 200.7		
Samples and Matrix	72 Surface water samples		
Field Duplicate Pairs	None		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review* (January 2017).

OVERALL EVALUATION

No results were rejected or qualified. All may be used as reported.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
N	All samples were received at the laboratory unpreserved (pH = 6 to 7). The samples were analyzed for total chromium on the day after collection; therefore, no qualifications were applied.



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
NA	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
Y	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
NA	

MS/MSD:

Within Criteria	Exceedance/Notes
Y	

Post digestion spikes:

Within Criteria	Exceedance/Notes
Y	

Serial dilutions:

Within Criteria	Exceedance/Notes
Y	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Target analyte identification:

Within Criteria	Exceedance/Notes
NA	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	All detected results were less than their reporting limits. The laboratory correctly qualified these as estimated (flagged “J”).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



U.S. Steel Hexavalent Chrome Water Results
Pace Analytical Report No. 50168998

Sample ID	Lab ID	Analyte	Lab results	Lab Qualifiers	DL	R:	Units	Val. Results	Val. Qualifiers
USS-SW-002A-041717	50168998051	Chromium		U	0.47	10.0	ug/L	10	U
USS-SW-002B-041717	50168998052	Chromium	0.66	J	0.47	10.0	ug/L	0.66	J
USS-SW-003A-041717	50168998053	Chromium		U	0.47	10.0	ug/L	10	U
USS-SW-003B-041717	50168998054	Chromium		U	0.47	10.0	ug/L	10	U
USS-SW-004A-041717	50168998055	Chromium		U	0.47	10.0	ug/L	10	U
USS-SW-004B-041717	50168998056	Chromium	0.57	J	0.47	10.0	ug/L	0.57	J
USS-SW-005A-041717	50168998057	Chromium	0.84	J	0.47	10.0	ug/L	0.84	J
USS-SW-005B-041717	50168998058	Chromium		U	0.47	10.0	ug/L	10	U
USS-SW-006A-041717	50168998059	Chromium		U	0.47	10.0	ug/L	10	U
USS-SW-006B-041717	50168998060	Chromium	0.76	J	0.47	10.0	ug/L	0.76	J
USS-SW-007-A-041717	50168998061	Chromium	0.60	J	0.47	10.0	ug/L	0.6	J
USS-SW-007-B-041717	50168998062	Chromium	1.0	J	0.47	10.0	ug/L	1.0	J
USS-SW-008-A-041717	50168998063	Chromium	0.74	J	0.47	10.0	ug/L	0.74	J
USS-SW-008-B-041717	50168998064	Chromium	0.92	J	0.47	10.0	ug/L	0.92	J
USS-SW-009-A-041717	50168998065	Chromium		U	0.47	10.0	ug/L	10	U
USS-SW-009-B-041717	50168998066	Chromium	0.87	J	0.47	10.0	ug/L	0.87	J
USS-SW-010-A-041717	50168998067	Chromium		U	0.47	10.0	ug/L	10	U
USS-SW-010-B-041717	50168998068	Chromium		U	0.47	10.0	ug/L	10	U
USS-SW-011-A-041717	50168998069	Chromium		U	0.47	10.0	ug/L	10	U
USS-SW-011-B-041717	50168998070	Chromium	0.49	J	0.47	10.0	ug/L	0.49	J
USS-SW-012-A-041717	50168998071	Chromium		U	0.47	10.0	ug/L	10	U
USS-SW-012-B-041717	50168998072	Chromium		U	0.47	10.0	ug/L	10	U
USS-SW-A001-A-041717	50168998001	Chromium	2.1	J	0.58	10.0	ug/L	2.1	J
USS-SW-A001-B-041717	50168998002	Chromium	1.4	J	0.58	10.0	ug/L	1.4	J
USS-SW-A002-A-041717	50168998003	Chromium	1.5	J	0.58	10.0	ug/L	1.5	J
USS-SW-A002-B-041717	50168998004	Chromium	1.2	J	0.58	10.0	ug/L	1.2	J
USS-SW-A003-A-041717	50168998005	Chromium	1.9	J	0.58	10.0	ug/L	1.9	J
USS-SW-A003-B-041717	50168998006	Chromium	2.2	J	0.58	10.0	ug/L	2.2	J
USS-SW-B001-A-041717	50168998007	Chromium	1.8	J	0.58	10.0	ug/L	1.8	J
USS-SW-B001-B-041717	50168998008	Chromium	1.7	J	0.58	10.0	ug/L	1.7	J
USS-SW-B002-A-041717	50168998009	Chromium	0.91	J	0.47	10.0	ug/L	0.91	J
USS-SW-B002-B-041717	50168998010	Chromium	1.7	J	0.58	10.0	ug/L	1.7	J
USS-SW-B003-A-041717	50168998011	Chromium	2.0	J	0.58	10.0	ug/L	2.0	J
USS-SW-B003-B-041717	50168998012	Chromium	1.2	J	0.58	10.0	ug/L	1.2	J
USS-SW-C001-A-041717	50168998013	Chromium	1.4	J	0.58	10.0	ug/L	1.4	J
USS-SW-C001-B-041717	50168998014	Chromium	2.2	J	0.58	10.0	ug/L	2.2	J
USS-SW-C002-A-041717	50168998015	Chromium	1.4	J	0.58	10.0	ug/L	1.4	J

U.S. Steel Hexavalent Chrome Water Results
Pace Analytical Report No. 50168998

Sample ID	Lab ID	Analyte	Lab results	Lab Qualifiers	DL	R:	Units	Val. Results	Val. Qualifiers
USS-SW-C002-B-041717	50168998016	Chromium	1.8	J	0.58	10.0	ug/L	1.8 J	
USS-SW-C003-A-041717	50168998017	Chromium	2.2	J	0.58	10.0	ug/L	2.2 J	
USS-SW-C003-B-041717	50168998018	Chromium	1.5	J	0.58	10.0	ug/L	1.5 J	
USS-SW-D001-A-041717	50168998019	Chromium	1.4	J	0.58	10.0	ug/L	1.4 J	
USS-SW-D001-B-041717	50168998020	Chromium	1.2	J	0.58	10.0	ug/L	1.2 J	
USS-SW-D002-A-041717	50168998021	Chromium	1.7	J	0.58	10.0	ug/L	1.7 J	
USS-SW-D002-B-041717	50168998022	Chromium		U	0.47	10.0	ug/L	10 U	
USS-SW-D003-A-041717	50168998023	Chromium		U	0.47	10.0	ug/L	10 U	
USS-SW-D003-B-041717	50168998024	Chromium		U	0.47	10.0	ug/L	10 U	
USS-SW-E001-A-041717	50168998025	Chromium		U	0.47	10.0	ug/L	10 U	
USS-SW-E001-B-041717	50168998026	Chromium		U	0.47	10.0	ug/L	10 U	
USS-SW-E002-A-041717	50168998027	Chromium	0.73	J	0.47	10.0	ug/L	0.73 J	
USS-SW-E002-B-041717	50168998028	Chromium		U	0.47	10.0	ug/L	10 U	
USS-SW-E003-A-041717	50168998029	Chromium		U	0.47	10.0	ug/L	10 U	
USS-SW-E003-B-041717	50168998030	Chromium		U	0.47	10.0	ug/L	10 U	
USS-SW-F001-A-041717	50168998031	Chromium		U	0.47	10.0	ug/L	10 U	
USS-SW-F001-B-041717	50168998032	Chromium		U	0.47	10.0	ug/L	10 U	
USS-SW-F002-A-041717	50168998033	Chromium		U	0.47	10.0	ug/L	10 U	
USS-SW-F002-B-041717	50168998034	Chromium		U	0.47	10.0	ug/L	10 U	
USS-SW-F003-A-041717	50168998035	Chromium	0.60	J	0.47	10.0	ug/L	0.60 J	
USS-SW-F003-B-041717	50168998036	Chromium		U	0.47	10.0	ug/L	10 U	
USS-SW-G001-A-041717	50168998037	Chromium		U	0.47	10.0	ug/L	10 U	
USS-SW-G001-B-041717	50168998038	Chromium		U	0.47	10.0	ug/L	10 U	
USS-SW-G002-A-041717	50168998039	Chromium		U	0.47	10.0	ug/L	10 U	
USS-SW-G002-B-041717	50168998040	Chromium		U	0.47	10.0	ug/L	10 U	
USS-SW-G003-A-041717	50168998041	Chromium		U	0.47	10.0	ug/L	10 U	
USS-SW-G003-B-041717	50168998042	Chromium		U	0.47	10.0	ug/L	10 U	
USS-SW-H001-A-041717	50168998043	Chromium		U	0.47	10.0	ug/L	10 U	
USS-SW-H001-B-041717	50168998044	Chromium	0.57	J	0.47	10.0	ug/L	0.57 J	
USS-SW-H002-A-041717	50168998045	Chromium		U	0.47	10.0	ug/L	10 U	
USS-SW-H002-B-041717	50168998046	Chromium	0.76	J	0.47	10.0	ug/L	0.76 J	
USS-SW-H003-A-041717	50168998047	Chromium	0.52	J	0.47	10.0	ug/L	0.52 J	
USS-SW-H003-B-041717	50168998048	Chromium	0.59	J	0.47	10.0	ug/L	0.59 J	
USS-SW-Intake-A-041717	50168998049	Chromium	0.76	J	0.47	10.0	ug/L	0.76 J	
USS-SW-Intake-B-041717	50168998050	Chromium		U	0.47	10.0	ug/L	10 U	

DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Site Name	U.S. Steel Hexavalent Chrome Release	TDD No.	S05-0001-1704-201
Document Tracking No.	1688M	Technical Reviewer (signature and date)	<i>Jessica A. Vickers</i> May 2, 2017
Data Reviewer (signature and date)	<i>Harry N. Ellis III</i> 24 April 2017	Laboratory	Pace Analytical/Indianapolis, Indiana
Laboratory Report No.	50168999		
Analyses	Hexavalent chromium by SW-846 Method 7196A and total chromium by SW-846 Method 6010B		
Samples and Matrix	14 Surface soil samples and 2 field duplicates		
Field Duplicate Pairs	USS-SS-DB01-041717/USS-SS-DB01-041717-D and USS-SS-PB02-041717/USS-SS-PB02-041717-D		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review* (January 2017).

OVERALL EVALUATION

Results were neither rejected nor qualified. All may be used as reported.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
NA	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
Y	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
NA	

MS/MSD:

Within Criteria	Exceedance/Notes
Y	

Post digestion spikes:

Within Criteria	Exceedance/Notes
Y	

Serial dilutions:

Within Criteria	Exceedance/Notes
Y	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
Y	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
NA	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	All total chromium results were above the RL, while all hexavalent chromium results were non-detect.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



U.S. Steel Hexavalent Chrome Soil Results
Pace Analytical Report No. 50168999

Sample ID	Lab ID	Analyte	Lab Results	Lab Qualifiers	DL	RL	Units	Val. Results	Val. Qualifiers
USS-SS-BB01-041717	50168999007	Chromium	1.3		0.42	0.84	mg/kg	1.3	
USS-SS-BB01-041717	50168999007	Chromium, Hexavalent		U	0.65	2.0	mg/kg	2.0	U
USS-SS-BB02-041717	50168999008	Chromium	5.8		0.42	0.85	mg/kg	5.8	
USS-SS-BB02-041717	50168999008	Chromium, Hexavalent		U	0.65	2.0	mg/kg	2.0	U
USS-SS-DB01-041717	50168999001	Chromium	4.1		0.43	0.86	mg/kg	4.1	
USS-SS-DB01-041717	50168999001	Chromium, Hexavalent		U	0.63	1.9	mg/kg	1.9	U
USS-SS-DB01-041717-D	50168999015	Chromium	2.6		0.45	0.91	mg/kg	2.6	
USS-SS-DB01-041717-D	50168999015	Chromium, Hexavalent		U	0.65	2.0	mg/kg	2.0	U
USS-SS-DB02-041717	50168999002	Chromium	1.8		0.49	0.99	mg/kg	1.8	
USS-SS-DB02-041717	50168999002	Chromium, Hexavalent		U	0.65	2.0	mg/kg	2.0	U
USS-SS-KB01-041717	50168999003	Chromium	1.9		0.45	0.90	mg/kg	1.9	
USS-SS-KB01-041717	50168999003	Chromium, Hexavalent		U	0.64	2.0	mg/kg	2.0	U
USS-SS-KB02-041717	50168999004	Chromium	2.3		0.44	0.87	mg/kg	2.3	
USS-SS-KB02-041717	50168999004	Chromium, Hexavalent		U	0.65	2.0	mg/kg	2.0	U
USS-SS-OD01-041717	50168999011	Chromium	2.1		0.48	0.97	mg/kg	2.1	
USS-SS-OD01-041717	50168999011	Chromium, Hexavalent		U	0.64	2.0	mg/kg	2.0	U
USS-SS-OD02-041717	50168999012	Chromium	2.0		0.45	0.91	mg/kg	2.0	
USS-SS-OD02-041717	50168999012	Chromium, Hexavalent		U	0.64	1.9	mg/kg	1.9	U
USS-SS-PB01-041717	50168999005	Chromium	2.5		0.45	0.90	mg/kg	2.5	
USS-SS-PB01-041717	50168999005	Chromium, Hexavalent		U	0.64	2.0	mg/kg	2.0	U
USS-SS-PB02-041717	50168999006	Chromium	3.7		0.44	0.88	mg/kg	3.7	
USS-SS-PB02-041717	50168999006	Chromium, Hexavalent		U	0.64	2.0	mg/kg	2.0	U
USS-SS-PB02-041717-D	50168999016	Chromium	2.8		0.45	0.91	mg/kg	2.8	
USS-SS-PB02-041717-D	50168999016	Chromium, Hexavalent		U	0.65	2.0	mg/kg	2.0	U
USS-SS-PL01-041717	50168999013	Chromium	3.3		0.46	0.92	mg/kg	3.3	
USS-SS-PL01-041717	50168999013	Chromium, Hexavalent		U	0.64	2.0	mg/kg	2.0	U
USS-SS-PL02-041717	50168999014	Chromium	8.7		0.48	0.95	mg/kg	8.7	
USS-SS-PL02-041717	50168999014	Chromium, Hexavalent		U	0.65	2.0	mg/kg	2.0	U
USS-SS-WB01-041717	50168999009	Chromium	1.8		0.43	0.86	mg/kg	1.8	
USS-SS-WB01-041717	50168999009	Chromium, Hexavalent		U	0.64	2.0	mg/kg	2.0	U
USS-SS-WB02-041717	50168999010	Chromium	1.8		0.48	0.96	mg/kg	1.8	
USS-SS-WB02-041717	50168999010	Chromium, Hexavalent		U	0.65	2.0	mg/kg	2.0	U

DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Site Name	U.S. Steel Hexavalent Chrome Release	TDD No.	S05-0001-1704-201
Document Tracking No.	1688N	Technical Reviewer (signature and date)	<i>Jessica A. Vickers</i> May 2, 2017
Data Reviewer (signature and date)	<i>Harry N. Ellis III</i> 26 April 2017	Laboratory	Pace Analytical/Indianapolis, Indiana
Laboratory Report No.	50169100		
Analyses	Total chromium by EPA Method 200.7		
Samples and Matrix	72 Surface water samples		
Field Duplicate Pairs	None		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review* (January 2017).

OVERALL EVALUATION

No results were rejected or qualified. All may be used as reported.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
N	Three samples were received at the laboratory unpreserved (pH = 7). All samples were analyzed for total chromium on the day after collection; therefore, no qualifications were applied.



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
NA	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
Y	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
NA	

MS/MSD:

Within Criteria	Exceedance/Notes
Y	

Post digestion spikes:

Within Criteria	Exceedance/Notes
Y	

Serial dilutions:

Within Criteria	Exceedance/Notes
Y	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Target analyte identification:

Within Criteria	Exceedance/Notes
NA	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	All detected results were less than their reporting limits. The laboratory correctly qualified these as estimated (flagged “J”).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



U.S. Steel Hexavalent Chrome Water Results
Pace Analytical Report No. 50169100

Sample ID	Lab ID	Analyte	Lab Results	Lab Qualifiers	DL	RL	Units	Val. Results	Val. Qualifiers
USS-SW-002A-041817	50169100051	Chromium	1.5	J	0.58	10.0	ug/L	1.5 J	
USS-SW-002B-041817	50169100052	Chromium	0.86	J	0.58	10.0	ug/L	0.86 J	
USS-SW-003A-041817	50169100053	Chromium	1.7	J	0.58	10.0	ug/L	1.7 J	
USS-SW-003B-041817	50169100054	Chromium	1.8	J	0.58	10.0	ug/L	1.8 J	
USS-SW-004A-041817	50169100055	Chromium	2.6	J	0.58	10.0	ug/L	2.6 J	
USS-SW-004B-041817	50169100056	Chromium	1.5	J	0.58	10.0	ug/L	1.5 J	
USS-SW-005A-041817	50169100057	Chromium	2.0	J	0.58	10.0	ug/L	2.0 J	
USS-SW-005B-041817	50169100058	Chromium	1.7	J	0.58	10.0	ug/L	1.7 J	
USS-SW-006A-041817	50169100059	Chromium	0.85	J	0.58	10.0	ug/L	0.85 J	
USS-SW-006B-041817	50169100060	Chromium	2.3	J	0.58	10.0	ug/L	2.3 J	
USS-SW-007-A-041817	50169100061	Chromium	0.90	J	0.58	10.0	ug/L	0.9 J	
USS-SW-007-B-041817	50169100062	Chromium	1.2	J	0.58	10.0	ug/L	1.2 J	
USS-SW-008-A-041817	50169100063	Chromium	1.5	J	0.58	10.0	ug/L	1.5 J	
USS-SW-008-B-041817	50169100064	Chromium	1.8	J	0.58	10.0	ug/L	1.8 J	
USS-SW-009-A-041817	50169100065	Chromium	1.4	J	0.58	10.0	ug/L	1.4 J	
USS-SW-009-B-041817	50169100066	Chromium	1.3	J	0.58	10.0	ug/L	1.3 J	
USS-SW-010-A-041817	50169100067	Chromium	1.0	J	0.58	10.0	ug/L	1.0 J	
USS-SW-010-B-041817	50169100068	Chromium	1.2	J	0.58	10.0	ug/L	1.2 J	
USS-SW-011-A-041817	50169100069	Chromium	2.2	J	0.58	10.0	ug/L	2.2 J	
USS-SW-011-B-041817	50169100070	Chromium	1.3	J	0.58	10.0	ug/L	1.3 J	
USS-SW-012-A-041817	50169100071	Chromium	1.7	J	0.58	10.0	ug/L	1.7 J	
USS-SW-012-B-041817	50169100072	Chromium	1.8	J	0.58	10.0	ug/L	1.8 J	
USS-SW-A001-A-041817	50169100001	Chromium	2.1	J	0.58	10.0	ug/L	2.1 J	
USS-SW-A001-B-041817	50169100002	Chromium	2.8	J	0.58	10.0	ug/L	2.8 J	
USS-SW-A002-A-041817	50169100003	Chromium	1.8	J	0.58	10.0	ug/L	1.8 J	
USS-SW-A002-B-041817	50169100004	Chromium	2.5	J	0.58	10.0	ug/L	2.5 J	
USS-SW-A003-A-041817	50169100005	Chromium	2.1	J	0.58	10.0	ug/L	2.1 J	
USS-SW-A003-B-041817	50169100006	Chromium	1.8	J	0.58	10.0	ug/L	1.8 J	
USS-SW-B001-A-041817	50169100007	Chromium	1.8	J	0.58	10.0	ug/L	1.8 J	
USS-SW-B001-B-041817	50169100008	Chromium	2.1	J	0.58	10.0	ug/L	2.1 J	
USS-SW-B002-A-041817	50169100009	Chromium	2.0	J	0.58	10.0	ug/L	2.0 J	
USS-SW-B002-B-041817	50169100010	Chromium	2.0	J	0.58	10.0	ug/L	2.0 J	
USS-SW-B003-A-041817	50169100011	Chromium	2.2	J	0.58	10.0	ug/L	2.2 J	
USS-SW-B003-B-041817	50169100012	Chromium	2.6	J	0.58	10.0	ug/L	2.6 J	
USS-SW-C001-A-041817	50169100013	Chromium	1.7	J	0.58	10.0	ug/L	1.7 J	
USS-SW-C001-B-041817	50169100014	Chromium	2.0	J	0.58	10.0	ug/L	2.0 J	
USS-SW-C002-A-041817	50169100015	Chromium	2.3	J	0.58	10.0	ug/L	2.3 J	

U.S. Steel Hexavalent Chrome Water Results
Pace Analytical Report No. 50169100

Sample ID	Lab ID	Analyte	Lab Results	Lab Qualifiers	DL	RL	Units	Val. Results	Val. Qualifiers
USS-SW-C002-B-041817	50169100016	Chromium	1.9	J	0.58	10.0	ug/L	1.9 J	
USS-SW-C003-A-041817	50169100017	Chromium	3.7	J	0.58	10.0	ug/L	3.7 J	
USS-SW-C003-B-041817	50169100018	Chromium	3.3	J	0.58	10.0	ug/L	3.3 J	
USS-SW-D001-A-041817	50169100019	Chromium	2.2	J	0.58	10.0	ug/L	2.2 J	
USS-SW-D001-B-041817	50169100020	Chromium	2.8	J	0.58	10.0	ug/L	2.8 J	
USS-SW-D002-A-041817	50169100021	Chromium	2.1	J	0.58	10.0	ug/L	2.1 J	
USS-SW-D002-B-041817	50169100022	Chromium	1.9	J	0.58	10.0	ug/L	1.9 J	
USS-SW-D003-A-041817	50169100023	Chromium	2.6	J	0.58	10.0	ug/L	2.6 J	
USS-SW-D003-B-041817	50169100024	Chromium	2.5	J	0.58	10.0	ug/L	2.5 J	
USS-SW-E001-A-041817	50169100025	Chromium	2.2	J	0.58	10.0	ug/L	2.2 J	
USS-SW-E001-B-041817	50169100026	Chromium	3.7	J	0.58	10.0	ug/L	3.7 J	
USS-SW-E002-A-041817	50169100027	Chromium	2.8	J	0.58	10.0	ug/L	2.8 J	
USS-SW-E002-B-041817	50169100028	Chromium	2.3	J	0.58	10.0	ug/L	2.3 J	
USS-SW-E003-A-041817	50169100029	Chromium	3.4	J	0.58	10.0	ug/L	3.4 J	
USS-SW-E003-B-041817	50169100030	Chromium	3.2	J	0.58	10.0	ug/L	3.2 J	
USS-SW-F001-A-041817	50169100031	Chromium	2.4	J	0.58	10.0	ug/L	2.4 J	
USS-SW-F001-B-041817	50169100032	Chromium	2.1	J	0.58	10.0	ug/L	2.1 J	
USS-SW-F002-A-041817	50169100033	Chromium	2.3	J	0.58	10.0	ug/L	2.3 J	
USS-SW-F002-B-041817	50169100034	Chromium	2.8	J	0.58	10.0	ug/L	2.8 J	
USS-SW-F003-A-041817	50169100035	Chromium	1.7	J	0.58	10.0	ug/L	1.7 J	
USS-SW-F003-B-041817	50169100036	Chromium	3.0	J	0.58	10.0	ug/L	3.0 J	
USS-SW-G001-A-041817	50169100037	Chromium	2.4	J	0.58	10.0	ug/L	2.4 J	
USS-SW-G001-B-041817	50169100038	Chromium	3.5	J	0.58	10.0	ug/L	3.5 J	
USS-SW-G002-A-041817	50169100039	Chromium	2.9	J	0.58	10.0	ug/L	2.9 J	
USS-SW-G002-B-041817	50169100040	Chromium	2.7	J	0.58	10.0	ug/L	2.7 J	
USS-SW-G003-A-041817	50169100041	Chromium	2.5	J	0.58	10.0	ug/L	2.5 J	
USS-SW-G003-B-041817	50169100042	Chromium	2.4	J	0.58	10.0	ug/L	2.4 J	
USS-SW-H001-A-041817	50169100043	Chromium	2.0	J	0.58	10.0	ug/L	2.0 J	
USS-SW-H001-B-041817	50169100044	Chromium	2.0	J	0.58	10.0	ug/L	2.0 J	
USS-SW-H002-A-041817	50169100045	Chromium	2.5	J	0.58	10.0	ug/L	2.5 J	
USS-SW-H002-B-041817	50169100046	Chromium	2.0	J	0.58	10.0	ug/L	2.0 J	
USS-SW-H003-A-041817	50169100047	Chromium	1.3	J	0.58	10.0	ug/L	1.3 J	
USS-SW-H003-B-041817	50169100048	Chromium	2.0	J	0.58	10.0	ug/L	2.0 J	
USS-SW-Intake-A-041817	50169100049	Chromium	0.99	J	0.58	10.0	ug/L	0.99 J	
USS-SW-Intake-B-041817	50169100050	Chromium	0.93	J	0.58	10.0	ug/L	0.93 J	



May 24, 2017

Andrew Maguire
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604-3507

**Subject: Data Validation Report
U.S. Steel Hexavalent Chrome Release
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1704-201
Document Tracking No. 1730**

Dear Mr. Maguire:

Tetra Tech, Inc. (Tetra Tech) is submitting these Data Validation Reports for 122 surface water samples (plus 13 field duplicates) and 38 soil samples (plus four field duplicates) collected at the U.S. Steel Hexavalent Chrome Release Site. The samples were collected on April 12 through 18, 2017, and were analyzed for hexavalent chromium and total chromium by STAT Analysis Corporation and Pace Analytical Laboratories. The last laboratory data package was received on May 12.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) Inorganic Superfund Data Review* (January 2017).

No results were rejected. All may be used as qualified, as detailed in the attachment.

If you have any questions regarding these data validation reports, please call me at (312) 201-7756.

Sincerely,

A handwritten signature in black ink that reads 'Gary N. Ellis III'.

START Chemist


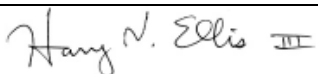
Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Justin Button-Hutchens, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORT
STAT ANALYTICAL REPORTS 17040414, 17040415, 17040460,
AND 17040461 AND
PACE ANALYTICAL REPORT 50169099**

DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Site Name	U.S. Steel Hexavalent Chrome Release	TDD No.	S05-0001-1704-201
Document Tracking No.	1730A	Quality Control Reviewer (signature and date)	 23 May 2017
Data Reviewer (signature and date)	 16 May 2017	Laboratory	STAT Analysis/Chicago, Illinois
Laboratory Report No.	17040414		
Analyses	Hexavalent chromium by EPA SW-846 Method 7196A		
Samples and Matrix	14 Soil samples		
Field Duplicate Pairs	None		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review* (January 2017).

OVERALL EVALUATION

Hexavalent chromium was not detected in any of the samples. Results were neither rejected nor qualified. All may be used as reported.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
NA	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
NA	

MS/MSD:

Within Criteria	Exceedance/Notes
Y	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Target analyte identification:

Within Criteria	Exceedance/Notes
NA	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	No hexavalent chromium was detected in the field samples.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Overall Qualifications:


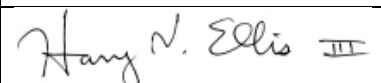
See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



U.S. Steel Hex Chrome Release Soil Results
STAT Report No. 17040414

Sample ID	Lab ID	Chemical_Name	Lab Results	Lab Qualifiers	MDL	RL	DF	Units	Val. Results	Val. Qualifiers
USS-SS-DB01-041217	17040414-001	Chromium, Hexavalent	0.40	U	0.16	0.40		1 mg/Kg	0.4	U
USS-SS-DB02-041217	17040414-002	Chromium, Hexavalent	0.40	U	0.16	0.40		1 mg/Kg	0.4	U
USS-SS-KB01-041217	17040414-003	Chromium, Hexavalent	0.40	U	0.16	0.40		1 mg/Kg	0.4	U
USS-SS-KB02-041217	17040414-004	Chromium, Hexavalent	0.40	U	0.16	0.40		1 mg/Kg	0.4	U
USS-SS-PB01-041217	17040414-005	Chromium, Hexavalent	0.40	U	0.16	0.40		1 mg/Kg	0.4	U
USS-SS-PB02-041217	17040414-006	Chromium, Hexavalent	0.40	U	0.16	0.40		1 mg/Kg	0.4	U
USS-SS-BB01-041217	17040414-007	Chromium, Hexavalent	0.40	U	0.16	0.40		1 mg/Kg	0.4	U
USS-SS-BB02-041217	17040414-008	Chromium, Hexavalent	0.40	U	0.16	0.40		1 mg/Kg	0.4	U
USS-SS-WB01-041217	17040414-009	Chromium, Hexavalent	0.40	U	0.16	0.40		1 mg/Kg	0.4	U
USS-SS-WB02-041217	17040414-010	Chromium, Hexavalent	0.40	U	0.16	0.40		1 mg/Kg	0.4	U
USS-SS-OD01-041217	17040414-011	Chromium, Hexavalent	0.40	U	0.16	0.40		1 mg/Kg	0.4	U
USS-SS-OD02-041217	17040414-012	Chromium, Hexavalent	0.40	U	0.16	0.40		1 mg/Kg	0.4	U
USS-SS-PL01-041217	17040414-013	Chromium, Hexavalent	0.40	U	0.16	0.40		1 mg/Kg	0.4	U
USS-SS-PL02-041217	17040414-014	Chromium, Hexavalent	0.40	U	0.16	0.40		1 mg/Kg	0.4	U

Site Name	U.S. Steel Hexavalent Chrome Release	TDD No.	S05-0001-1704-201
Document Tracking No.	1730B	Quality Control Reviewer (signature and date)	 23 May 2017
Data Reviewer (signature and date)	 16 May 2017	Laboratory	STAT Analysis/Chicago, Illinois
Laboratory Report No.	17040415		
Analyses	Total chromium by EPA SW-846 Method 6020 and hexavalent chromium by EPA SW-846 Method 7196A		
Samples and Matrix	57 Surface water samples plus field duplicate		
Field Duplicate Pairs	USS-SW-UPTAKE-A-041217/USS-SW-UPTAKE-A-041217-D		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review* (January 2017).

OVERALL EVALUATION

No result were rejected, but a number were qualified. All may be used as qualified.

Data completeness:

Within Criteria	Exceedance/Notes
Y	



Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
N	Most samples were analyzed for hexavalent chromium a few hours after expiration of the 24-hour holding time. STAT flagged these results "H". They were qualified as estimated, possibly biased low, and flagged "UJ" or "J-", as appropriate. Nine samples were not properly preserved (acidified) for total chromium analysis. They were acidified on arrival at the laboratory and analyzed within 2 days of collection, so no qualifications were applied.

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
NA	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	



Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
Y	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
NA	

MS/MSD:

Within Criteria	Exceedance/Notes
Y	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	



Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	All samples were analyzed for total chromium at 2-fold dilutions to minimize matrix interference. No qualifications were applied.

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	



Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
NA	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	Some detected results were below their sample reporting limits. STAT correctly flagged these results "J" as estimates.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	



Other [specify]:

Within Criteria	Exceedance/Notes
NA	

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



U.S.Steel Hexavalent Chromium Water Results
STAT Analytical Report No. 17040415

Sample ID	Lab ID	Chemical_Name	Lab Result	Lab Qualifier	DL	RL	DF	Units	Val. Results	Val. Qualifiers
USS-DW-Wetwell-041217	17040415-058	Chromium	0.00094	J	0.0006	0.0020		2 mg/L	0.00094	J
USS-DW-Wetwell-041217	17040415-058	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-002-A-041217	17040415-052	Chromium	0.0047		0.0006	0.0020		2 mg/L	0.0047	
USS-SW-002-A-041217	17040415-052	Chromium, Hexavalent	0.0026	J	0.002	0.010		1 mg/L	0.0026	J
USS-SW-002-B-041217	17040415-053	Chromium	0.0049		0.0006	0.0020		2 mg/L	0.0049	
USS-SW-002-B-041217	17040415-053	Chromium, Hexavalent	0.0026	J	0.002	0.010		1 mg/L	0.0026	J
USS-SW-003-A-041217	17040415-054	Chromium	0.0049		0.0006	0.0020		2 mg/L	0.0049	
USS-SW-003-A-041217	17040415-054	Chromium, Hexavalent	0.0025	J	0.002	0.010		1 mg/L	0.0025	J
USS-SW-003-B-041217	17040415-055	Chromium	0.0055		0.0006	0.0020		2 mg/L	0.0055	
USS-SW-003-B-041217	17040415-055	Chromium, Hexavalent	0.0029	J	0.002	0.010		1 mg/L	0.0029	J
USS-SW-004-A-041217	17040415-056	Chromium	0.0044		0.0006	0.0020		2 mg/L	0.0044	
USS-SW-004-A-041217	17040415-056	Chromium, Hexavalent	0.010	U	0.002	0.010		1 mg/L	0.01	U
USS-SW-004-B-041217	17040415-057	Chromium	0.0046		0.0006	0.0020		2 mg/L	0.0046	
USS-SW-004-B-041217	17040415-057	Chromium, Hexavalent	0.0021	J	0.002	0.010		1 mg/L	0.0021	J
USS-SW-A001-A-041217	17040415-001	Chromium	0.0018	J	0.0006	0.0020		2 mg/L	0.0018	J
USS-SW-A001-A-041217	17040415-001	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-A001-B-041217	17040415-002	Chromium	0.0018	J	0.0006	0.0020		2 mg/L	0.0018	J
USS-SW-A001-B-041217	17040415-002	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-A002-A-041217	17040415-003	Chromium	0.0019	J	0.0006	0.0020		2 mg/L	0.0019	J
USS-SW-A002-A-041217	17040415-003	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-A002-B-041217	17040415-004	Chromium	0.0019	J	0.0006	0.0020		2 mg/L	0.0019	J
USS-SW-A002-B-041217	17040415-004	Chromium, Hexavalent	0.0024	JH	0.002	0.010		1 mg/L	0.0024	J-
USS-SW-A003-A-041217	17040415-005	Chromium	0.0019	J	0.0006	0.0020		2 mg/L	0.0019	J
USS-SW-A003-A-041217	17040415-005	Chromium, Hexavalent	0.0024	JH	0.002	0.010		1 mg/L	0.0024	J-
USS-SW-A003-B-041217	17040415-006	Chromium	0.0017	J	0.0006	0.0020		2 mg/L	0.0017	J
USS-SW-A003-B-041217	17040415-006	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-B001-A-041217	17040415-007	Chromium	0.0018	J	0.0006	0.0020		2 mg/L	0.0018	J
USS-SW-B001-A-041217	17040415-007	Chromium, Hexavalent	0.0022	JH	0.002	0.010		1 mg/L	0.0022	J-
USS-SW-B001-B-041217	17040415-008	Chromium	0.0020		0.0006	0.0020		2 mg/L	0.002	
USS-SW-B001-B-041217	17040415-008	Chromium, Hexavalent	0.0021	JH	0.002	0.010		1 mg/L	0.0021	J-
USS-SW-B002-A-041217	17040415-009	Chromium	0.0021		0.0006	0.0020		2 mg/L	0.0021	
USS-SW-B002-A-041217	17040415-009	Chromium, Hexavalent	0.0022	JH	0.002	0.010		1 mg/L	0.0022	J-
USS-SW-B002-B-041217	17040415-010	Chromium	0.0018	J	0.0006	0.0020		2 mg/L	0.0018	J
USS-SW-B002-B-041217	17040415-010	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-B003-A-041217	17040415-011	Chromium	0.0018	J	0.0006	0.0020		2 mg/L	0.0018	J

U.S.Steel Hexavalent Chromium Water Results
STAT Analytical Report No. 17040415

Sample ID	Lab ID	Chemical_Name	Lab Result	Lab Qualifier	DL	RL	DF	Units	Val. Results	Val. Qualifiers
USS-SW-B003-A-041217	17040415-011	Chromium, Hexavalent	0.0045	JH	0.002	0.010		1 mg/L	0.0045	J-
USS-SW-B003-B-041217	17040415-012	Chromium	0.0019	J	0.0006	0.0020		2 mg/L	0.0019	J
USS-SW-B003-B-041217	17040415-012	Chromium, Hexavalent	0.0031	JH	0.002	0.010		1 mg/L	0.0031	J-
USS-SW-C001-A-041217	17040415-013	Chromium	0.0017	J	0.0006	0.0020		2 mg/L	0.0017	J
USS-SW-C001-A-041217	17040415-013	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-C001-B-041217	17040415-014	Chromium	0.0017	J	0.0006	0.0020		2 mg/L	0.0017	J
USS-SW-C001-B-041217	17040415-014	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-C002-A-041217	17040415-015	Chromium	0.0017	J	0.0006	0.0020		2 mg/L	0.0017	J
USS-SW-C002-A-041217	17040415-015	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-C002-B-041217	17040415-016	Chromium	0.0094		0.0006	0.0020		2 mg/L	0.0094	
USS-SW-C002-B-041217	17040415-016	Chromium, Hexavalent	0.0026	JH	0.002	0.010		1 mg/L	0.0026	J-
USS-SW-C003-A-041217	17040415-017	Chromium	0.026		0.0006	0.0020		2 mg/L	0.026	
USS-SW-C003-A-041217	17040415-017	Chromium, Hexavalent	0.0026	JH	0.002	0.010		1 mg/L	0.0026	J-
USS-SW-C003-B-041217	17040415-018	Chromium	0.028		0.0006	0.0040		2 mg/L	0.028	
USS-SW-C003-B-041217	17040415-018	Chromium, Hexavalent	0.0021	JH	0.002	0.010		1 mg/L	0.0021	J-
USS-SW-D001-A-041217	17040415-019	Chromium	0.0028		0.0006	0.0020		2 mg/L	0.0028	
USS-SW-D001-A-041217	17040415-019	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-D001-B-041217	17040415-020	Chromium	0.0025		0.0006	0.0020		2 mg/L	0.0025	
USS-SW-D001-B-041217	17040415-020	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-D002-A-041217	17040415-021	Chromium	0.0020		0.0006	0.0020		2 mg/L	0.002	
USS-SW-D002-A-041217	17040415-021	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-D002-B-041217	17040415-022	Chromium	0.0023		0.0006	0.0020		2 mg/L	0.0023	
USS-SW-D002-B-041217	17040415-022	Chromium, Hexavalent	0.0025	JH	0.002	0.010		1 mg/L	0.0025	J-
USS-SW-D003-A-041217	17040415-023	Chromium	0.0092		0.0006	0.0020		2 mg/L	0.0092	
USS-SW-D003-A-041217	17040415-023	Chromium, Hexavalent	0.0022	JH	0.002	0.010		1 mg/L	0.0022	J-
USS-SW-D003-B-041217	17040415-024	Chromium	0.0088		0.0006	0.0020		2 mg/L	0.0088	
USS-SW-D003-B-041217	17040415-024	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-E001-A-041217	17040415-025	Chromium	0.0026		0.0006	0.0020		2 mg/L	0.0026	
USS-SW-E001-A-041217	17040415-025	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-E001-B-041217	17040415-026	Chromium	0.0025		0.0006	0.0020		2 mg/L	0.0025	
USS-SW-E001-B-041217	17040415-026	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-E002-A-041217	17040415-027	Chromium	0.0027		0.0006	0.0020		2 mg/L	0.0027	
USS-SW-E002-A-041217	17040415-027	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-E002-B-041217	17040415-028	Chromium	0.0026		0.0006	0.0020		2 mg/L	0.0026	
USS-SW-E002-B-041217	17040415-028	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ


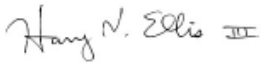
U.S.Steel Hexavalent Chromium Water Results
STAT Analytical Report No. 17040415

Sample ID	Lab ID	Chemical_Name	Lab Result	Lab Qualifier	DL	RL	DF	Units	Val. Results	Val. Qualifiers
USS-SW-E003-A-041217	17040415-029	Chromium	0.0057		0.0006	0.0020		2 mg/L	0.0057	
USS-SW-E003-A-041217	17040415-029	Chromium, Hexavalent	0.0022	JH	0.002	0.010		1 mg/L	0.0022	J-
USS-SW-E003-B-041217	17040415-030	Chromium	0.0065		0.0006	0.0020		2 mg/L	0.0065	
USS-SW-E003-B-041217	17040415-030	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-F001-A-041217	17040415-031	Chromium	0.0026		0.0006	0.0020		2 mg/L	0.0026	
USS-SW-F001-A-041217	17040415-031	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-F001-B-041217	17040415-032	Chromium	0.0034		0.0006	0.0020		2 mg/L	0.0034	
USS-SW-F001-B-041217	17040415-032	Chromium, Hexavalent	0.0023	JH	0.002	0.010		1 mg/L	0.0023	J-
USS-SW-F002-A-041217	17040415-033	Chromium	0.0024		0.0006	0.0020		2 mg/L	0.0024	
USS-SW-F002-A-041217	17040415-033	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-F002-B-041217	17040415-034	Chromium	0.0025		0.0006	0.0020		2 mg/L	0.0025	
USS-SW-F002-B-041217	17040415-034	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-F003-A-041217	17040415-035	Chromium	0.0072		0.0006	0.0020		2 mg/L	0.0072	
USS-SW-F003-A-041217	17040415-035	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-F003-B-041217	17040415-036	Chromium	0.0069		0.0006	0.0020		2 mg/L	0.0069	
USS-SW-F003-B-041217	17040415-036	Chromium, Hexavalent	0.0023	JH	0.002	0.010		1 mg/L	0.0023	J-
USS-SW-G001-A-041217	17040415-037	Chromium	0.0058		0.0006	0.0020		2 mg/L	0.0058	
USS-SW-G001-A-041217	17040415-037	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-G001-B-041217	17040415-038	Chromium	0.0057		0.0006	0.0020		2 mg/L	0.0057	
USS-SW-G001-B-041217	17040415-038	Chromium, Hexavalent	0.0036	JH	0.002	0.010		1 mg/L	0.0036	J-
USS-SW-G002-A-041217	17040415-039	Chromium	0.0071		0.0006	0.0020		2 mg/L	0.0071	
USS-SW-G002-A-041217	17040415-039	Chromium, Hexavalent	0.0024	JH	0.002	0.010		1 mg/L	0.0024	J-
USS-SW-G002-B-041217	17040415-040	Chromium	0.0061		0.0006	0.0020		2 mg/L	0.0061	
USS-SW-G002-B-041217	17040415-040	Chromium, Hexavalent	0.0022	JH	0.002	0.010		1 mg/L	0.0022	J-
USS-SW-G003-A-041217	17040415-041	Chromium	0.0071		0.0006	0.0020		2 mg/L	0.0071	
USS-SW-G003-A-041217	17040415-041	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-G003-B-041217	17040415-042	Chromium	0.0077		0.0006	0.0020		2 mg/L	0.0077	
USS-SW-G003-B-041217	17040415-042	Chromium, Hexavalent	0.0021	JH	0.002	0.010		1 mg/L	0.0021	J-
USS-SW-H001-A-041217	17040415-043	Chromium	0.0063		0.0006	0.0020		2 mg/L	0.0063	
USS-SW-H001-A-041217	17040415-043	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-H001-B-041217	17040415-044	Chromium	0.0067		0.0006	0.0020		2 mg/L	0.0067	
USS-SW-H001-B-041217	17040415-044	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-H002-A-041217	17040415-045	Chromium	0.0097		0.0006	0.0020		2 mg/L	0.0097	
USS-SW-H002-A-041217	17040415-045	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-H002-B-041217	17040415-046	Chromium	0.015		0.0006	0.0020		2 mg/L	0.015	

U.S.Steel Hexavalent Chromium Water Results
STAT Analytical Report No. 17040415

Sample ID	Lab ID	Chemical_Name	Lab Result	Lab Qualifier	DL	RL	DF	Units	Val. Results	Val. Qualifiers
USS-SW-H002-B-041217	17040415-046	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-H003-A-041217	17040415-047	Chromium	0.0085		0.0006	0.0020		2 mg/L	0.0085	
USS-SW-H003-A-041217	17040415-047	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-H003-B-041217	17040415-048	Chromium	0.0091		0.0006	0.0020		2 mg/L	0.0091	
USS-SW-H003-B-041217	17040415-048	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-INTAKE-A-041217	17040415-049	Chromium	0.0021		0.0006	0.0020		2 mg/L	0.0021	
USS-SW-INTAKE-A-041217	17040415-049	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-INTAKE-A-041217-D	17040415-050	Chromium	0.0020		0.0006	0.0020		2 mg/L	0.002	
USS-SW-INTAKE-A-041217-D	17040415-050	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-INTAKE-B-041217	17040415-051	Chromium	0.0014	J	0.0006	0.0020		2 mg/L	0.0014	J
USS-SW-INTAKE-B-041217	17040415-051	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ

DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Site Name	U.S. Steel Hexavalent Chrome Release	TDD No.	S05-0001-1704-201
Document Tracking No.	1730C	Quality Control Reviewer (signature and date)	 23 May 2017
Data Reviewer (signature and date)	 17 May 2017	Laboratory	STAT Analysis/Chicago, Illinois
Laboratory Report No.	17040460		
Analyses	Hexavalent chromium by EPA SW-846 Method 7196A		
Samples and Matrix	14 Soil samples, 7 surface water samples, and 3 field duplicates (2 soil and 1 water)		
Field Duplicate Pairs	USS-SS-BB01-041317/USS-SS-BB01-041217-D, USS-SS-BB02-041217/USS-SS-BB02-071317-D, and USS-SW-BB02-041317/USS-SW-BB02-041317		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review* (January 2017).

OVERALL EVALUATION

Hexavalent chromium was not detected in any of the samples. No results were rejected, but some were qualified. All may be used as qualified.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
N	The surface water samples were analyzed a few hours after expiration of the 24-hour holding time. Therefore, the surface water results were qualified as estimated, possibly biased low, and flagged "UJ".



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
NA	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
NA	

MS/MSD:

Within Criteria	Exceedance/Notes
Y	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4

EPA REGION 5 START CONTRACT

Target analyte identification:

Within Criteria	Exceedance/Notes
NA	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	All results were nondetected.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Overall Qualifications:


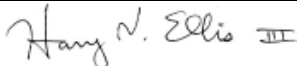
See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



U.S. Steel Hex Chrome Release Soil and Water Results
STAT Analytical Report No. 17040460

Sample ID	Lab ID	Chemical_Name	Lab Result	Lab Qualifier	DL	RL	DF	Units	Val. Results	Val. Qualifiers
USS-SS-BB01-041317	17040460-007	Chromium, Hexavalent	0.40	U	0.16	0.40		1 mg/Kg	0.4	U
USS-SS-BB01-041317-D	17040460-008	Chromium, Hexavalent	0.40	U	0.16	0.40		1 mg/Kg	0.4	U
USS-SS-BB02-041317	17040460-009	Chromium, Hexavalent	0.40	U	0.16	0.40		1 mg/Kg	0.4	U
USS-SS-BB02-041317-D	17040460-010	Chromium, Hexavalent	0.40	U	0.16	0.40		1 mg/Kg	0.4	U
USS-SS-DB01-041317	17040460-001	Chromium, Hexavalent	0.40	U	0.16	0.40		1 mg/Kg	0.4	U
USS-SS-DB02-041317	17040460-002	Chromium, Hexavalent	0.40	U	0.16	0.40		1 mg/Kg	0.4	U
USS-SS-KB01-041317	17040460-003	Chromium, Hexavalent	0.40	U	0.16	0.40		1 mg/Kg	0.4	U
USS-SS-KB02-041317	17040460-004	Chromium, Hexavalent	0.40	U	0.16	0.40		1 mg/Kg	0.4	U
USS-SS-OD01-041317	17040460-013	Chromium, Hexavalent	0.40	U	0.16	0.40		1 mg/Kg	0.4	U
USS-SS-OD02-041317	17040460-014	Chromium, Hexavalent	0.40	U	0.16	0.40		1 mg/Kg	0.4	U
USS-SS-PB01-041317	17040460-005	Chromium, Hexavalent	0.40	U	0.16	0.40		1 mg/Kg	0.4	U
USS-SS-PB02-041317	17040460-006	Chromium, Hexavalent	0.40	U	0.16	0.40		1 mg/Kg	0.4	U
USS-SS-PL01-041317	17040460-015	Chromium, Hexavalent	0.40	U	0.16	0.40		1 mg/Kg	0.4	U
USS-SS-PL02-041317	17040460-016	Chromium, Hexavalent	0.40	U	0.16	0.40		1 mg/Kg	0.4	U
USS-SS-WB01-041317	17040460-011	Chromium, Hexavalent	0.40	U	0.16	0.40		1 mg/Kg	0.4	U
USS-SS-WB02-041317	17040460-012	Chromium, Hexavalent	0.40	U	0.16	0.40		1 mg/Kg	0.4	U
USS-SW-BB02-041317	17040460-020	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-BB02-041317-D	17040460-021	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-DB02-041317	17040460-017	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-KB02-041317	17040460-018	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-OD02-041317	17040460-023	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-PB02-041317	17040460-019	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-PL02-041317	17040460-024	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ
USS-SW-WB02-041317	17040460-022	Chromium, Hexavalent	0.010	UH	0.002	0.010		1 mg/L	0.01	UJ

Site Name	U.S. Steel Hexavalent Chrome Release	TDD No.	S05-0001-1704-201
Document Tracking No.	1730D	Quality Control Reviewer (signature and date)	 23 May 2017
Data Reviewer (signature and date)	 17 May 2017	Laboratory	STAT Analysis/Chicago, Illinois
Laboratory Report No.	17040461		
Analyses	Total chromium by EPA SW-846 Method 6020 and hexavalent chromium by EPA SW-846 Method 7196A		
Samples and Matrix	58 Surface water samples and 11 field duplicate samples		
Field Duplicate Pairs	USS-SW-A003-A-041317/USS-SW-A003-A-041317-D, USS-SW-C003-A-041317/USS-SW-C003-A-041317-D, USS-SW-F001-A/USS-SW-F001-A-041317-D, USS-SW-F003-A/USS-SW-F003-A-041317-D, USS-SW-G001-B-041317/USS-SW-G001-B-041317-D, USS-SS-INTAKE-A-041317/USS-SS-INTAKE-A-041317-D, USS-SW-002-A-041317/USS-SW-002-A-041317-D, USS-SW-002-B-041317/USS-SW-002-B-041317-D, USS-SW-003-B-041317/USS-SW-003-B-041317-D, USS-SW-004-B-041317/USS-SW-004-B-041317-D, and USS-SW-005-B-041317/USS-SW-005-B-041317-D		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review* (January 2017).

OVERALL EVALUATION

No results were rejected, but a number were qualified. All may be used as qualified.

Data completeness:

Within Criteria	Exceedance/Notes
Y	



Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
N	Many samples were analyzed for hexavalent chromium one or more hours after expiration of their 24-hour holding times. STAT flagged these "H". All such results were qualified as estimated, probably biased low, and flagged "UJ" or "J-", as appropriate.

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
NA	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	



Field blanks:

Within Criteria	Exceedance/Notes
NA	

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
Y	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
NA	

MS/MSD:

Within Criteria	Exceedance/Notes
Y	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	



Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	All total chromium analyses were performed at 2-fold dilutions to minimize matrix interference.

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	



Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
NA	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	Many of the detected results were less than their sample reporting limits. STAT correctly flagged these "J" to indicate that they are estimated.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



U.S. Steel Hex CHrome Release Water Results
STAT Analytical Report No. 17040461

Sample ID	Lab ID	Chemical_Name	Lab Results	Lab Qualifiers	DL	RL	DF	Units	Val. Results	Val. Qualifiers
USS-SW-002-A-041317	17040461-057	Chromium	0.0017	J	0.0006	0.0020	2	mg/L	0.0017	J
USS-SW-002-A-041317	17040461-057	Chromium, Hexavalent	0.0022	J	0.002	0.010	1	mg/L	0.0022	J
USS-SW-002-A-041317-D	17040461-059	Chromium	0.0018	J	0.0006	0.0020	2	mg/L	0.0018	J
USS-SW-002-B-041317	17040461-058	Chromium	0.0017	J	0.0006	0.0020	2	mg/L	0.0017	J
USS-SW-002-B-041317	17040461-058	Chromium, Hexavalent	0.010	U	0.002	0.010	1	mg/L	0.01	U
USS-SW-002-B-041317-D	17040461-060	Chromium	0.0018	J	0.0006	0.0020	2	mg/L	0.0018	J
USS-SW-002-B-041317-D	17040461-060	Chromium, Hexavalent	0.010	U	0.002	0.010	1	mg/L	0.01	U
USS-SW-003-A-041317	17040461-061	Chromium	0.0015	J	0.0006	0.0020	2	mg/L	0.0015	J
USS-SW-003-A-041317	17040461-061	Chromium, Hexavalent	0.010	U	0.002	0.010	1	mg/L	0.01	U
USS-SW-003-B-041317	17040461-062	Chromium	0.0018	J	0.0006	0.0020	2	mg/L	0.0018	J
USS-SW-003-B-041317	17040461-062	Chromium, Hexavalent	0.010	U	0.002	0.010	1	mg/L	0.01	U
USS-SW-003-B-041317-D	17040461-063	Chromium	0.0016	J	0.0006	0.0020	2	mg/L	0.0016	J
USS-SW-004-A-041317	17040461-064	Chromium	0.0015	J	0.0006	0.0020	2	mg/L	0.0015	J
USS-SW-004-A-041317	17040461-064	Chromium, Hexavalent	0.010	U	0.002	0.010	1	mg/L	0.01	U
USS-SW-004-B-041317	17040461-065	Chromium	0.0015	J	0.0006	0.0020	2	mg/L	0.0015	J
USS-SW-004-B-041317	17040461-065	Chromium, Hexavalent	0.010	U	0.002	0.010	1	mg/L	0.01	U
USS-SW-004-B-041317-D	17040461-069	Chromium	0.0016	J	0.0006	0.0020	2	mg/L	0.0016	J
USS-SW-004-B-041317-D	17040461-069	Chromium, Hexavalent	0.010	U	0.002	0.010	1	mg/L	0.01	U
USS-SW-005-A-041317	17040461-066	Chromium	0.0015	J	0.0006	0.0020	2	mg/L	0.0015	J
USS-SW-005-A-041317	17040461-066	Chromium, Hexavalent	0.010	U	0.002	0.010	1	mg/L	0.01	U
USS-SW-005-B-041317	17040461-067	Chromium	0.0015	J	0.0006	0.0020	2	mg/L	0.0015	J
USS-SW-005-B-041317	17040461-067	Chromium, Hexavalent	0.010	U	0.002	0.010	1	mg/L	0.01	U
USS-SW-005-B-041317-D	17040461-068	Chromium	0.0016	J	0.0006	0.0020	2	mg/L	0.0016	J
USS-SW-A001-A-041317	17040461-001	Chromium	0.0017	J	0.0006	0.0020	2	mg/L	0.0017	J
USS-SW-A001-A-041317	17040461-001	Chromium, Hexavalent	0.0022	JH	0.002	0.010	1	mg/L	0.0022	J-
USS-SW-A001-B-041317	17040461-002	Chromium	0.0016	J	0.0006	0.0020	2	mg/L	0.0016	J
USS-SW-A001-B-041317	17040461-002	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	J-
USS-SW-A002-A-041317	17040461-003	Chromium	0.0015	J	0.0006	0.0020	2	mg/L	0.0015	J
USS-SW-A002-A-041317	17040461-003	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-A002-B-041317	17040461-004	Chromium	0.0015	J	0.0006	0.0020	2	mg/L	0.0015	J
USS-SW-A002-B-041317	17040461-004	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-A003-A-041317	17040461-005	Chromium	0.0014	J	0.0006	0.0020	2	mg/L	0.0014	J
USS-SW-A003-A-041317	17040461-005	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-A003-A-041317-D	17040461-006	Chromium, Hexavalent	0.0020	JH	0.002	0.010	1	mg/L	0.002	J-
USS-SW-A003-B-041317	17040461-007	Chromium	0.0013	J	0.0006	0.0020	2	mg/L	0.0013	J

U.S. Steel Hex CHrome Release Water Results
STAT Analytical Report No. 17040461

Sample ID	Lab ID	Chemical_Name	Lab Results	Lab Qualifiers	DL	RL	DF	Units	Val. Results	Val. Qualifiers
USS-SW-A003-B-041317	17040461-007	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-B001-A-041317	17040461-008	Chromium	0.0015	J	0.0006	0.0020	2	mg/L	0.0015	J
USS-SW-B001-A-041317	17040461-008	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-B001-B-041317	17040461-009	Chromium	0.0014	J	0.0006	0.0020	2	mg/L	0.0014	J
USS-SW-B001-B-041317	17040461-009	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-B002-A	17040461-010	Chromium	0.0016	J	0.0006	0.0020	2	mg/L	0.0016	J
USS-SW-B002-A	17040461-010	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-B002-B	17040461-011	Chromium	0.0014	J	0.0006	0.0020	2	mg/L	0.0014	J
USS-SW-B002-B	17040461-011	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-B003-A	17040461-012	Chromium	0.0018	J	0.0006	0.0020	2	mg/L	0.0018	J
USS-SW-B003-A	17040461-012	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-B003-B	17040461-013	Chromium	0.0014	J	0.0006	0.0020	2	mg/L	0.0014	J
USS-SW-B003-B	17040461-013	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-C001-A	17040461-014	Chromium	0.0014	J	0.0006	0.0020	2	mg/L	0.0014	J
USS-SW-C001-A	17040461-014	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-C001-A-041317-D	17040461-018	Chromium	0.0014	J	0.0006	0.0020	2	mg/L	0.0014	J
USS-SW-C001-B	17040461-015	Chromium	0.0014	J	0.0006	0.0020	2	mg/L	0.0014	J
USS-SW-C001-B	17040461-015	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-C002-A	17040461-016	Chromium	0.0016	J	0.0006	0.0020	2	mg/L	0.0016	J
USS-SW-C002-A	17040461-016	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-C002-B	17040461-017	Chromium	0.0015	J	0.0006	0.0020	2	mg/L	0.0015	J
USS-SW-C002-B	17040461-017	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-C003-A-041317	17040461-019	Chromium	0.0018	J	0.0006	0.0020	2	mg/L	0.0018	J
USS-SW-C003-A-041317	17040461-019	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-C003-B-041317	17040461-020	Chromium	0.0020		0.0006	0.0020	2	mg/L	0.002	
USS-SW-C003-B-041317	17040461-020	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-D001-A	17040461-021	Chromium	0.0019	J	0.0006	0.0020	2	mg/L	0.0019	J
USS-SW-D001-A	17040461-021	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-D001-B	17040461-022	Chromium	0.0029		0.0006	0.0020	2	mg/L	0.0029	
USS-SW-D001-B	17040461-022	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-D002-A	17040461-023	Chromium	0.0015	J	0.0006	0.0020	2	mg/L	0.0015	J
USS-SW-D002-A	17040461-023	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-D002-B	17040461-024	Chromium	0.0016	J	0.0006	0.0020	2	mg/L	0.0016	J
USS-SW-D002-B	17040461-024	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-D003-A	17040461-025	Chromium	0.0016	J	0.0006	0.0020	2	mg/L	0.0016	J

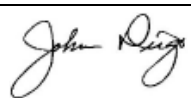
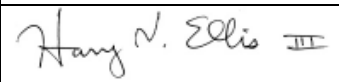
U.S. Steel Hex CHrome Release Water Results
STAT Analytical Report No. 17040461

Sample ID	Lab ID	Chemical_Name	Lab Results	Lab Qualifiers	DL	RL	DF	Units	Val. Results	Val. Qualifiers
USS-SW-D003-A	17040461-025	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-D003-B	17040461-026	Chromium	0.0017	J	0.0006	0.0020	2	mg/L	0.0017	J
USS-SW-D003-B	17040461-026	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-E001-A	17040461-027	Chromium	0.0020	J	0.0006	0.0020	2	mg/L	0.002	J
USS-SW-E001-A	17040461-027	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-E001-B	17040461-028	Chromium	0.0022		0.0006	0.0020	2	mg/L	0.0022	
USS-SW-E001-B	17040461-028	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-E002-A	17040461-029	Chromium	0.0029		0.0006	0.0020	2	mg/L	0.0029	
USS-SW-E002-A	17040461-029	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-E002-B	17040461-030	Chromium	0.0021		0.0006	0.0020	2	mg/L	0.0021	
USS-SW-E002-B	17040461-030	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-E003-A	17040461-031	Chromium	0.0017	J	0.0006	0.0020	2	mg/L	0.0017	J
USS-SW-E003-A	17040461-031	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-E003-B	17040461-032	Chromium	0.0019	J	0.0006	0.0020	2	mg/L	0.0019	J
USS-SW-E003-B	17040461-032	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-F001-A	17040461-033	Chromium	0.0069		0.0006	0.0020	2	mg/L	0.0069	
USS-SW-F001-A	17040461-033	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-F001-B	17040461-034	Chromium	0.0021		0.0006	0.0020	2	mg/L	0.0021	
USS-SW-F001-B	17040461-034	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-F001-B-041317-D	17040461-035	Chromium	0.0021		0.0006	0.0020	2	mg/L	0.0021	
USS-SW-F002-A	17040461-036	Chromium	0.0023		0.0006	0.0020	2	mg/L	0.0023	
USS-SW-F002-A	17040461-036	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-F002-B	17040461-037	Chromium	0.0026		0.0006	0.0020	2	mg/L	0.0026	
USS-SW-F002-B	17040461-037	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-F003-A	17040461-038	Chromium	0.0029		0.0006	0.0020	2	mg/L	0.0029	
USS-SW-F003-A	17040461-038	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-F003-A-041317-D	17040461-040	Chromium	0.0023		0.0006	0.0020	2	mg/L	0.0023	
USS-SW-F003-B	17040461-039	Chromium	0.0026		0.0006	0.0020	2	mg/L	0.0026	
USS-SW-F003-B	17040461-039	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-G001-A-041317	17040461-041	Chromium	0.0015	J	0.0006	0.0020	2	mg/L	0.0015	J
USS-SW-G001-A-041317	17040461-041	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-G001-B-041317	17040461-042	Chromium	0.0016	J	0.0006	0.0020	2	mg/L	0.0016	J
USS-SW-G001-B-041317	17040461-042	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-G001-B-041317-D	17040461-043	Chromium	0.0026		0.0006	0.0020	2	mg/L	0.0026	
USS-SW-G001-B-041317-D	17040461-043	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ

U.S. Steel Hex CHrome Release Water Results
STAT Analytical Report No. 17040461

Sample ID	Lab ID	Chemical_Name	Lab Results	Lab Qualifiers	DL	RL	DF	Units	Val. Results	Val. Qualifiers
USS-SW-G002-A-041317	17040461-044	Chromium	0.0013	J	0.0006	0.0020	2	mg/L	0.0013	J
USS-SW-G002-A-041317	17040461-044	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-G002-B-041317	17040461-045	Chromium	0.0020	J	0.0006	0.0020	2	mg/L	0.002	J
USS-SW-G002-B-041317	17040461-045	Chromium, Hexavalent	0.0022	JH	0.002	0.010	1	mg/L	0.0022	J-
USS-SW-G003-A-041317	17040461-046	Chromium	0.0028		0.0006	0.0020	2	mg/L	0.0028	
USS-SW-G003-A-041317	17040461-046	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-G003-B-041317	17040461-047	Chromium	0.0032		0.0006	0.0020	2	mg/L	0.0032	
USS-SW-G003-B-041317	17040461-047	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-H001-A-041317	17040461-048	Chromium	0.0030		0.0006	0.0020	2	mg/L	0.003	
USS-SW-H001-A-041317	17040461-048	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-H001-B-041317	17040461-049	Chromium	0.0031		0.0006	0.0020	2	mg/L	0.0031	
USS-SW-H001-B-041317	17040461-049	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-H002-A-041317	17040461-050	Chromium	0.0032		0.0006	0.0020	2	mg/L	0.0032	
USS-SW-H002-A-041317	17040461-050	Chromium, Hexavalent	0.0030	JH	0.002	0.010	1	mg/L	0.003	J-
USS-SW-H002-B-041317	17040461-051	Chromium	0.014		0.0006	0.0020	2	mg/L	0.014	
USS-SW-H002-B-041317	17040461-051	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-H003-A041317	17040461-052	Chromium	0.0018	J	0.0006	0.0020	2	mg/L	0.0018	J
USS-SW-H003-A041317	17040461-052	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-H003-B-041317	17040461-053	Chromium	0.0019	J	0.0006	0.0020	2	mg/L	0.0019	J
USS-SW-H003-B-041317	17040461-053	Chromium, Hexavalent	0.010	UH	0.002	0.010	1	mg/L	0.01	UJ
USS-SW-INTAKE-A-041317	17040461-054	Chromium	0.0020	J	0.0006	0.0020	2	mg/L	0.002	J
USS-SW-INTAKE-A-041317	17040461-054	Chromium, Hexavalent	0.010	U	0.002	0.010	1	mg/L	0.01	U
USS-SW-INTAKE-A-041317-D	17040461-055	Chromium	0.0018	J	0.0006	0.0020	2	mg/L	0.0018	J
USS-SW-INTAKE-B-041317	17040461-056	Chromium	0.0019	J	0.0006	0.0020	2	mg/L	0.0019	J
USS-SW-INTAKE-B-041317	17040461-056	Chromium, Hexavalent	0.010	U	0.002	0.010	1	mg/L	0.01	U

DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Site Name	U.S. Steel Hexavalent Chrome Release	TDD No.	S05-0001-1704-201
Document Tracking No.	1730E	Quality Control Reviewer (signature and date)	 23 May 2017
Data Reviewer (signature and date)	 17 May 2017	Laboratory	Pace Analytical/Indianapolis, Indiana
Laboratory Report No.	50169099		
Analyses	Total chromium by EPA SW-846 Method 6010 and hexavalent chromium by EPA SW-846 Method 7196A		
Samples and Matrix	10 Soil samples and 2 field duplicates		
Field Duplicate Pairs	USS-SS-PB02-041817/USS-SS-PB02-041817-D and USS-SS-WB01-041817/USS-SS-WB01-041817-D		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review* (January 2017).

OVERALL EVALUATION

No results were rejected, but some were qualified. All may be used as qualified.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
NA	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
Y	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
NA	

MS/MSD:

Within Criteria	Exceedance/Notes
Y	

Post digestion spikes:

Within Criteria	Exceedance/Notes
Y	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
Y	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Field duplicates:

Within Criteria	Exceedance/Notes
N	The field duplicate pair from USS-SS-PB02-041817 exceeded the QAPP limit, with the primary sample yielding a considerably higher concentration of total chromium than the field duplicate pair. Because of this uncertainty as to the true concentration of chromium, the results in that pair were qualified as estimated and flagged “J”.

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
NA	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	Detected results less than sample reporting limits are not included.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



U.S. Steel Hex Chrome Release Soil Results
Pace Report No. 50169099

Sample ID	Lab ID	Parameter	Lab Result	Lab Qualifier	DL	RL	DF	Units	Val. Results	Val. Qualifiers
USS-SS-BB01-041817	50169099003	Chromium, Hexavalent		U	0.63	1.9	1	mg/kg	1.9	U
USS-SS-BB01-041817	50169099003	Chromium	2.7		0.44	0.87	1	mg/kg	2.7	
USS-SS-BB02-041817	50169099004	Chromium, Hexavalent		U	0.64	2.0	1	mg/kg	2.0	U
USS-SS-BB02-041817	50169099004	Chromium	7.3		0.48	0.97	1	mg/kg	7.3	
USS-SS-OD01-041817	50169099007	Chromium, Hexavalent		U	0.64	1.9	1	mg/kg	1.9	U
USS-SS-OD01-041817	50169099007	Chromium	1.3		0.44	0.88	1	mg/kg	1.3	
USS-SS-OD02-041817	50169099008	Chromium, Hexavalent		U	0.63	1.9	1	mg/kg	1.9	U
USS-SS-OD02-041817	50169099008	Chromium	4.3		0.44	0.89	1	mg/kg	4.3	
USS-SS-PB01-041817	50169099001	Chromium, Hexavalent		U	0.64	2.0	1	mg/kg	2.0	U
USS-SS-PB01-041817	50169099001	Chromium	1.8		0.46	0.93	1	mg/kg	1.8	
USS-SS-PB02-041817	50169099002	Chromium, Hexavalent		U	0.64	2.0	1	mg/kg	2.0	U
USS-SS-PB02-041817	50169099002	Chromium	9.2		0.47	0.94	1	mg/kg	9.2	J
USS-SS-PB02-041817-D	50169099012	Chromium, Hexavalent		U	0.66	2.0	1	mg/kg	2.0	U
USS-SS-PB02-041817-D	50169099012	Chromium	3.6		0.42	0.83	1	mg/kg	3.6	J
USS-SS-PL01-041817	50169099009	Chromium, Hexavalent		U	0.63	1.9	1	mg/kg	1.9	U
USS-SS-PL01-041817	50169099009	Chromium	2.7		0.49	0.98	1	mg/kg	2.7	
USS-SS-PL02-041817	50169099010	Chromium, Hexavalent		U	0.64	2.0	1	mg/kg	2.0	U
USS-SS-PL02-041817	50169099010	Chromium	4.8		0.45	0.91	1	mg/kg	4.8	
USS-SS-WB01-041817	50169099005	Chromium, Hexavalent		U	0.64	1.9	1	mg/kg	1.9	U
USS-SS-WB01-041817	50169099005	Chromium	7.4		0.47	0.93	1	mg/kg	7.4	
USS-SS-WB01-041817-D	50169099011	Chromium, Hexavalent		U	0.66	2.0	1	mg/kg	2.0	U
USS-SS-WB01-041817-D	50169099011	Chromium	3.8		0.45	0.89	1	mg/kg	3.8	
USS-SS-WB02-041817	50169099006	Chromium, Hexavalent		U	0.65	2.0	1	mg/kg	2.0	U
USS-SS-WB02-041817	50169099006	Chromium	2.4		0.48	0.96	1	mg/kg	2.4	



May 24, 2017

Andrew Maguire
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604-3507

**Subject: Data Validation Report
U.S. Steel Hexavalent Chrome Release
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1704-201
Document Tracking No. 1745**

Dear Mr. Maguire:

Tetra Tech, Inc. (Tetra Tech) is submitting this Data Validation Report for one surface water sample collected at the U.S. Steel Hexavalent Chrome Release Site. The sample was collected on April 11, 2017, and was analyzed for hexavalent chromium by STAT Analysis Corporation. The laboratory data package was received on May 23.

Analytical data were evaluated in general accordance with the EPA *Contract Laboratory Program (CLP) National Functional Guidelines (NFG) Inorganic Superfund Data Review* (January 2017).

The result was not qualified and may be used as reported.

If you have any questions regarding this data validation report, please call me at (312) 201-7756.

Sincerely,

A handwritten signature in black ink that reads 'Gary N. Ellis III'.

START Chemist


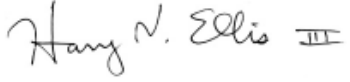
Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Justin Button-Hutchens, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

DATA VALIDATION REPORT STAT ANALYTICAL REPORT 17040375

DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Site Name	U.S. Steel Hexavalent Chrome Release	TDD No.	S05-0001-1704-201
Document Tracking No.	1745	Quality Control Reviewer (signature and date)	 24 May 2017
Data Reviewer (signature and date)	 24 May 2017	Laboratory	STAT Analysis/Chicago
Laboratory Report No.	17040375		
Analyses	Hexavalent Chromium by EPA SW-846 Method 7196A		
Samples and Matrix	1 Surface water sample		
Field Duplicate Pairs	None		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review* (January 2017).

OVERALL EVALUATION

Despite some minor irregularities, the result was not qualified and may be used as reported.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
NA	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
N	The aqueous method blank yielded a hexavalent chromium concentration just above the detection limit. The field sample result was much greater than that so no qualifications were applied.

Field blanks:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4

EPA REGION 5 START CONTRACT

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
NA	

MS/MSD:

Within Criteria	Exceedance/Notes
N	Recoveries could not be determined because the unspiked sample contained more than 4 times the amount of the spike. The relative percent difference between the results was only 1.45 percent, so no qualifications were applied.

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	Sample was analyzed at a 10-fold dilution

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4

EPA REGION 5 START CONTRACT

Internal Standards:

Within Criteria	Exceedance/Notes
NA	

Target analyte identification:

Within Criteria	Exceedance/Notes
NA	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



U.S. Steel Surface Water Results
STAT Report 17040375

Sample ID	Lab iD	Chemical_Name	Lab Result	:Lab Qualifier	DL	RL	DF	Units	Val. Results	Val. Qualifiers
USS-SW-001-041117	17040375-001	Chromium, Hexavalent	0.99		0.02	0.10		10 mg/L	0.99	